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## **Does Land Abundance Explain African Institutions?**

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# DOES LAND ABUNDANCE EXPLAIN AFRICAN INSTITUTIONS?

JAMES FENSKE\*

**Abstract.** I show how abundant land and scarce labor shaped African institutions before colonial rule. I present a model in which exogenous suitability of the land for agriculture and endogenously evolving population determine the existence of land rights, slavery, and polygyny. I then use crossectional data on pre-colonial African societies to demonstrate that, consistent with the model, the existence of land rights, slavery, and polygyny occurred in those parts of Africa that were the most suitable for agriculture, and in which population density was greatest. Next, I use the model to explain institutions among the Egba of southwestern Nigeria from 1830 to 1914. While many Egba institutions were typical of a land-abundant environment, they sold land and had disputes over it. These exceptions were the result of a period of land scarcity when the Egba first arrived at Abeokuta and of heterogeneity in the quality of land.

**Keywords:** Africa, institutions, land rights, slavery, polygyny.

**JEL Codes:** N57,O10.

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## 1. INTRODUCTION

Institutional failures such as corruption, bureaucracy, a lack of democracy, and deficient public services are a major cause of African poverty (Collier and Gunning, 1999a,b). The continent’s rare successes, similarly, are understood largely as stories of institutions (Acemoglu et al., 2003). The importance of institutions is not unique to Africa, as they are one of the principal channels through which history affects outcomes in the present (Greif, 2006; North, 1991; Nunn, 2009; Rodrik et al., 2004). Institutions, in particular those that protect private property, were instrumental in the rise of the “West” (Acemoglu et al., 2009, 2005; North and Weingast, 1989) and explain many of the differences in outcomes across former colonies (Acemoglu et al., 2001; Banerjee and Iyer, 2005; Dell, 2009; Iyer, 2008; Porta et al., 1997). This paper explains the origins of African institutions by showing how land rights, slavery, polygyny, and state strength in Africa prior to colonial rule were shaped by the continent’s sparse population.

History has shaped African development. The investments made and the institutions established under colonial rule continue to affect outcomes in Africa today (Bertocchi and Canova, 2002; Bolt and Bezemer, 2009; Huillery, 2009; Price, 2003). Existing arrangements, African resistance and limited resources, however, constrained what institutions were put in place by colonial powers (Austin, 2008b; Bubb, 2009; Huillery, 2008). As a result, pre-colonial institutions and the forces that shaped them, including state centralization, polygyny, indigenous slavery, and involvement in the slave trades, also shape current performance in Africa (Bezemer et al., 2009; Englebert, 2000; Gennaioli and Rainer, 2007; Nunn, 2008; Nunn and Wantchekon, 2008; Tertilt, 2005).

Explaining the nature of pre-colonial institutions in Africa is, then, important in understanding its current poverty. Several recent contributions have suggested that geography plays a major role in shaping institutions. Geographic features, such as continental orientation, settler mortality, suitability for specific crops, and other biogeographic endowments predict contemporary institutional differences across countries (Acemoglu et al., 2001; Diamond, 1997; Easterly, 2007; Easterly and Levine, 2003; Olsson, 2004; Olsson and Hibbs, 2005). In Africa, Nunn and Puga (2007) find that more rugged countries were able to escape the worst institutional effects of the slave trades. Engerman and Sokoloff (1997) have influentially argued that factor endowments in the Caribbean and Brazil were conducive to slave labor and large plantations, which set Latin America on a long-run path of higher inequality and less democratic political institutions than what developed in North America.

A major argument in the literature on African history is that the continent’s geography has given it an abundance of land relative to labor, which explains the general features of its development (Austin, 2008a, 2009b; Hopkins, 1973; Iliffe, 1995). This view holds that, since uncleared land was freely available, land had no price, rights to land were ill-defined, cultivators were not willing to become free workers, coerced and household labor substituted for wage employment, capital markets were constrained because land had no value as collateral, and states that could not tax land remained small and weak.

I test this thesis using two types of evidence. First, I employ data on a cross-section of African societies from Murdock’s (1967) *Ethnographic Atlas* to support a model of land rights and slavery in which the land-labor ratio determines the institutions that exist. I find that the model correctly

predicts that land rights and slavery were found in those pre-colonial African societies that occupied the territory most suitable for agriculture, and that greater population densities were correlated with rights over land. Slavery was present in the most densely settled parts of Africa, reflecting the high opportunity cost of coercion at low levels of population. Polygyny existed in the most agriculturally suitable and most thickly settled parts of Africa; dense population is needed for inequality to emerge. While states were most developed in the most populated regions, agricultural suitability was not one of their systematic determinants.

Second, I trace how land abundance shaped economic institutions among the Egba of southwestern Nigeria between 1830 and 1914. While the Egba resembled in many ways the standard predictions for a land-abundant society, there are two principal exceptions to this pattern. First, the Egba sold land as early as 1870. Second, land disputes existed. These deviations are explained by initially high population densities created by the settlement of the Egba as refugees at Abeokuta, and by the specific features of certain parcels of land that gave them uncommon value.

The rest of this paper proceeds as follows. Section 2 outlines the literatures in economics and African history on how land abundance has shaped economic institutions. Section 3 presents the model, extends it to include polygyny, and identifies its testable implications. Section 4 tests the model by combining geographic data on population and the environment with institutional outcomes recorded in the Ethnographic Atlas. Section 5 accounts for the nature of property rights over land, labor, and capital in Egba society from 1830-1914. Section 6 concludes.

## 2. THE LAND ABUNDANCE VIEW OF AFRICAN HISTORY

Herbst (2000, p. 16) estimates the population density of Sub-Saharan Africa in 1900 at 4.4 persons per Sq. Km, contrasted with 38.2 for South Asia, 45.6 for China, and 62.9 for Europe.<sup>1</sup> Explanations of low African population densities stress geographic factors, the disease environment, and historical factors such as the slave trades (Mahadi and Inikori, 1987, p. 63-64). This sparse settlement, Hopkins (1973, p. 23-27) argues, shaped institutions, because Africans “measured wealth and power in men rather than in acres.”<sup>2</sup> Iliffe (1995, p. 1-2) summarizes this “land abundance” view:

Agricultural systems were mobile, adapting to the environment rather than transforming it ... Social organization also sought to maximize fertility, especially through polygyny, which made generational conflict a more important historical dynamic than class conflict. Sparse populations with ample land expressed social differentiation through control over people, possession of precious metals, and ownership of livestock ... Scattered settlement and huge distances hindered transport, limited the surplus the powerful could extract, prevented the emergence of literate elites and formal institutions, left the cultivator much freedom, and obstructed state formation.

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<sup>1</sup>His estimate for North Africa is 9.4 persons per Sq. Km.

<sup>2</sup>Austin (2008a, p. 589) argues that Hopkins was the first to make this analysis systematic; earlier writers on Africa did account for the existence of slavery, for example, by noting Africa’s land abundance – see Dowd (1917).

This section reviews the literatures on economic institutions in land-abundant agrarian societies and on how sparse population has shaped African history. It deals in turn with four major themes: land, labor, capital, and states.

## 2.1. Land.

2.1.1. *Theory.* With land abundance, monitoring costs in agriculture, and no scale economies, land will have no price and communal land will substitute for insurance (Binswanger and McIntire, 1987, p. 82-83). Boserup (1965, p. 13) argues that exogenous population growth increases the frequency of cultivation; families become more “conscious and jealous about their special right to the old plots” (p. 80), reduce fallow, and exert effort to retain their rights. Demsetz (1967, p. 350) suggests that integration into the world market will similarly lead property rights to develop in order to internalize externalities.

2.1.2. *In African history.* In the most extreme cases, African cultivators did not return to their old farms after they were left fallow.<sup>3</sup> Before the Atlantic slave trade, this led to settled clearings surrounded by vast wastelands in the Equatorial region, circles of increasingly wild vegetation in the West African forest, and clusters with oscillating frontiers in the West African Savanna. Austin (2009b, p. 33) argues that, as a consequence, land was “easily and cheaply accessible in institutional terms”; pre-colonial authorities were eager to attract “more people with whom to subdue nature and, if necessary, their neighbors,” so that strangers could generally acquire land indefinitely for token payments. These payments were made solely to acknowledge the sovereignty of the local authorities. Citizens were given land virtually freely.

Austin (2008a, p. 591-594) notes that ‘islands’ of intensive agriculture have existed where insecurity has created artificial land scarcity and in specific locations of exceptional value. These had minerals, trees, market access, or suitability for particular crops. In pre-colonial Tanganyika, while most land was freely available, the best land (banana plots, areas between highland and brush, and volcanic craters) was subject to specific rights and even sold (Iliffe, 1979, p. 16). In pre-colonial West Africa, isolated examples can be found where scarcity produced markets over land as a productive resource during the eighteenth and nineteenth centuries (Austin, 2009b, p. 33-35).

Against these views, Spear (1997, p. 154-157) argues that the Boserupian mechanism cannot explain individual cases. While on Mount Meru both the Arusha and the Meru intensified their agriculture as population rose, the less densely settled Meru did so more readily. Berry (1988), similarly, has noted that tree crops have not always created individualized tenure in West Africa, as inheritance rules, tenancy contracts, and labor arrangements can give many persons claims over the same farm. Thornton (1992, p. 75-76) suggests that ownership of land results from legal claims, not population pressure. The statistical results in Section 4 counter these objections by showing that the institutional effects of population and agricultural productivity are systematic, even if they are not deterministic.

## 2.2. Labor.

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<sup>3</sup>The regional survey here summarizes Iliffe (1995, p. 36 and 64-67).

2.2.1. *Theory.* With easy access to land and monitoring costs, employers cannot compensate laborers for forgone self-cultivation, and so there will be no laboring class and almost no hiring of labor during the peak season (Binswanger and McIntire, 1987, p. 76). Vertically extended households, whose heads have claims over the labor of their dependents, substitute for insurance and annuities that the thin capital market cannot provide (see below).

Land abundance has also been used to explain slavery. Domar (1970), building on Nieboer (1900), ties the the existence of serfdom in Eastern Europe to labor scarcity; free land, free peasants, and non-working landowners cannot coexist.<sup>4</sup> Land abundance is also held to affect family structure. Goody (1969, p. 66) argues that the ability of distant relatives to inherit in Africa is due to the lack of class differentiation and low value of land. Similarly, Goody (1976, p. 17) suggests that polygyny exists where allocating land to additional wives is less costly.

2.2.2. *In African history.* For Austin (2008a, p. 606-610), scarcity of labor explains African use of extensive agriculture, dry season crafts and industries, and forced labor. With some notable exceptions (Rodney, 1966), slavery was prevalent in much of Africa even prior to the Atlantic slave trade (Fage, 1969). Watson (1980, p. 10) suggests that the ability of slaves and their descendants to assimilate into their owners' lineages was a "logical extension of the institutionalized need for more people." Land abundance has also been used to explain specific cases (e.g. O'Fahey (1985, p. 91)) and differences across African societies. Northrup (1979) contrasts the densely-settled Igbo of the palm belt with the relatively sparsely populated northeastern Igbo during the palm oil trade. Slavery did not expand in the palm belt, while the northeastern Igbo used slaves extensively in their colonization of new land.

Family structures in Africa have also been linked to sparse population. Tambiah and Goody (1973, p. 23) explain bride-price by noting that, since men are not distinguished by land holdings, the price of a husband is low. Iliffe (1995, p. 96) argues that intense competition for women within and across generations led to the payment of bridewealth. Because wives' labor and reproductive capacities are so important, more than half of customary court cases in Africa are disputes over marriage, divorce or bridewealth (Kopytoff, 1987, p. 43). I differ from these views, and argue that polygyny can only exist when population is great enough for an elite to have already differentiated itself from the mass of the population.

The use of underpopulation to explain African slavery is controversial. Kopytoff and Miers (1977, p. 68-69) object that slaves filled social and political functions for which entire persons were needed, and not simply their labor. Further, political insecurity prevented people from taking advantage of surplus land and pushed them into servitude. Lovejoy (1978, p. 349) argues that slavery in the Sokoto Caliphate was "based on non-market principles," as slaves and output were redistributed

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<sup>4</sup>Conning (2004) has formalized this reasoning, finding that the return to enslavement rises with the land-labor ratio. *Contra* Domar (1970), North and Thomas (1971) argue that, during the fourteenth century, plagues in Europe increased the land-labor ratio, intensifying competition between landlords for tenants and resulting in a relaxation of servile obligations. Engerman and Sokoloff (2005), similarly, argue that abundant land and an absence of scale economies prevented the formation of large estates in Pennsylvania, Maryland, New York and Canada. In both these examples, the failure of slavery to emerge resulted from the limited means of coercion available to would-be lords. North and Thomas (1971) suggest that the lack of a centralized state failed to prevent slaveowners from competing over slaves. In the North American case, Engerman and Sokoloff (2005) acknowledge that the northern U.S. was priced out of the market for slaves as early as the 1760s.

mostly through the state. Miers and Klein (1998, p. 4-5), Miers (1998, p. 20) and Roberts and Miers (1988, p. 20) stress factors other than labor scarcity that made colonial rulers hesitant to abolish slavery, including their dependence on slave-owning elites, fear that abolition would divert trade, worries about disrupting peace, unwillingness to undermine male control of women, and their experience with India. Austin (2009a) responds that the rise in slave-holding throughout the Atlantic slave trade and the nineteenth century cannot be explained by the non-economic uses of slaves. The econometric results in Section 4 demonstrate that the presence of slavery across African regions was systematically related to the economic value of slaves and to population.

Kopytoff (1987, p. 46) suggests that dependents must be “seduced” rather than coerced, so slavery can only exist in complex societies with “well-developed systems of compulsion.” Goody (1980, p. 26-31), similarly, argues that slavery was most prevalent in states that victimized their neighbors. Section 3 will demonstrate that high costs of coercion at low population densities can be incorporated into a model in which slavery is explained by the high cost of free labor.

## 2.3. Capital.

2.3.1. *Theory.* Binswanger and McIntire (1987, p. 78) argue that credit markets under land abundance will be constrained by supply; land that has little value cannot serve as collateral. Livestock, prone to disease and theft, is a poor substitute for land as collateral (Binswanger and Rosenzweig, 1986, p. 517). Without land tenancy, interlinked credit cannot overcome information problems (Binswanger et al., 1989, p. 135). Simple technology and the thin hiring market similarly constrain the credit market from the demand side (Binswanger and McIntire, 1987, p. 78).

2.3.2. *In African history.* According to Austin (2009b, p. 33-37), credit transactions in pre-colonial West Africa were not a capital “market,” but instead a “vast range of discrete bargains between parties who would not have had the information to offer or receive competing terms from others.” Capital markets were not well distinguished from consumption loans. Interest rates were high. Loans were given in “extra-economic” relationships such as personal acquaintances, rotating savings and credit associations, family, patronage, or ethnic and religious diasporas. Austin (1993) argues that main cause of borrowing in pre-colonial West Africa was illiquidity, as cash was needed for major expenses such as funerals, to overcome slow turnovers in long-distance trade, and for scarce working capital. Since states were weak, repayment was enforced through private means such as panyarring (hostage-taking), secret societies, and the “court of public opinion.” With land unavailable as collateral, most substantial loans were backed by human pawns. The discussion of the Egba in Section 5 shows how these considerations shaped credit-provision within a single African society, and teases out interactions that existed between the land, marriage, labor and capital markets.

2.4. **States.** Prior to colonial rule, the “typical” Atlantic African lived in a state with an area no larger than 1,500 square kilometers and fewer than 30,000 inhabitants (Thornton, 1992, p. 105). African states were, Austin (2004a, p. 25) argues, “webs of relationship which grew steadily weaker with distance from the capital until they merged into the statelessness of peripheral peoples.”

Herbst (2000) has taken the broadcasting of power over sparsely populated territories to be the central problem facing African states past and present.

States could not raise revenues from land.<sup>5</sup> Unable to tie subjects to the land and tax them, states could not make land artificially scarce. Revenues for most states came from other sources, such as trade tolls. Rulers sought subjects and cattle, rather than territories. Warfare was for tribute or captives, rather than land. The ease of exit gave rise to the systematic formation of frontier settlements on the margins of successful African polities, in which many of the central features of African social organization were forged, including the importance of kin, divisions between first-comers and latecomers, and patrimonialism (Kopytoff, 1987). The econometric results presented in Section 4 will demonstrate that state strength in Africa has been systematically related to population, but not to agricultural suitability.

### 3. MODEL

This section extends the model of “slavery and other property rights” from Lagerlöf (2009) to include slave raiding from neighboring societies and polygyny. This formalizes the literature outlined in Section 2, as elite preferences over egalitarianism, slavery, and free labor are driven by agricultural productivity and population size. Population lowers wages and average product, making free labor preferable to slavery or egalitarianism. Productivity makes coercion worthwhile. The model adds to the literature by recognizing the importance of productivity and the high cost of coercion when population is low. Section 3.1 sets up the model. Section 3.2 describes its dynamics. Section 3.3 allows wives to be purchased, lowering the cost of children. Polygyny will only occur if inequality already exists. Section 3.4 outlines two tests of the model implemented in Section 4.

**3.1. Setup.** A society in period  $t$  has a population  $P_t$  of non-elite agents and a population of elite agents that has zero mass. Non-elite agents work; elite agents do not. Both live for one period. The elite is randomly selected from the population at the beginning of each period. Agents choose fertility  $n_t$  and consumption  $c_t$ . Children cost  $q$  each. If income is  $I_t$ , each agent’s budget constraint is:

$$(1) \quad c_t = I_t - qn_t.$$

With no utility from leisure, non-elite agents supply one unit of labor each. Utility is given by:

$$(2) \quad U_t = (1 - \beta) \ln c_t + \beta \ln n_t$$

$$(3) \quad \Rightarrow n_t^* = (\beta/q)I_t$$

Production is Cobb-Douglas, and output  $Y_t$  depends on land  $T$ , land-augmenting productivity  $\tilde{A}$ , and the labor used  $L_t$ :

$$(4) \quad Y_t = (T\tilde{A})^\alpha L_t^{1-\alpha} \equiv A^\alpha L_t^{1-\alpha},$$

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<sup>5</sup>The rest of this paragraph summarizes arguments made in Austin (2004a) and Austin (2004b).



where  $\alpha \in (0, 1)$ .  $A$  depends on  $\tilde{A}$  and  $T$ , but will be interpreted as agricultural suitability, given exogenously by the physical environment. The elite's payoff in period  $t$  under each of the three institutions, egalitarianism, slavery, and free labor, is given by  $\pi_t^i$ , where  $i \in \{E, S, F\}$ . The population's payoff is similarly given by  $m_t^i$ . At the beginning of each period, the society's neighbors raid it for  $R$  slaves, and nothing can prevent this. Initial conditions can be chosen so that  $P_t$  is always greater than  $R/\alpha$ . There is no voluntary migration across societies; agents who leave will be enslaved by their neighbors.

3.1.1. *Egalitarianism.* Under egalitarianism, there are no land rights and no slavery. Both the elite and the non-elite agents that remain after the society is raided receive average product:

$$(5) \quad \pi_t^E = m_t^E = \left( \frac{A}{P_t - R} \right)^\alpha.$$

3.1.2. *Free labor.* Under free labor, the elite encloses a fraction  $\theta$  of the land, creating rights over it. They hire non-elite agents at a competitive wage  $w_t$ . The elite's problem is:

$$(6) \quad \pi_t^F = \max_{L_t \in [0, P_t - R]} \{(\theta A)^\alpha L_t^{1-\alpha} - w_t L_t\}.$$

Non-elite agents not hired continue to work the remaining land communally, receiving income  $m_t^F = \left( \frac{(1-\theta)A}{P_t - R - L_t} \right)^\alpha$ . Equilibrium is achieved in the labor market when the wage (equal to the marginal product of labor on the elite's estate) is equal to the average product on the unenclosed land. This will be true when:

$$(7) \quad \begin{aligned} (1-\alpha)(\theta A)^\alpha L_t^{-\alpha} &= \left( \frac{(1-\theta)A}{P_t - R - L_t} \right)^\alpha \\ \Rightarrow L_t &= \frac{(1-\alpha)^{\frac{1}{\alpha}} \theta}{(1-\theta) + (1-\alpha)^{\frac{1}{\alpha}} \theta} (P_t - R) \equiv \sigma(P_t - R) \end{aligned}$$

$$(8) \quad \Rightarrow w_t = m_t^F = (1-\alpha)(\theta A)^\alpha (\sigma(P_t - R))^{-\alpha}$$

Substituting (7) and (8) into (6), the elite's payoff is:

$$(9) \quad \pi_t^F = \alpha \theta^\alpha \sigma^{1-\alpha} A^\alpha (P_t - R)^{1-\alpha}$$

3.1.3. *Slavery.* Under slavery, the elite encloses a fraction  $\theta$  of the land, creating rights over it. They raid their neighbors for slaves, at an elastic cost  $r$ ,<sup>6</sup> which includes the cost of guarding the slaves and feeding them while they are used in production. It is assumed for simplicity that free workers will not work alongside slaves. Slaves do not reproduce.

The elite's problem is:

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<sup>6</sup>It is assumed the elite's holding is small enough relative to its neighbors' population that it does not face the possibility of enslaving the entire neighboring population.

$$(10) \quad \pi_t^S = \max_{S_t} \{(\theta A)^\alpha S_t^{1-\alpha} - r S_t\}.$$

Solving for the elite's preferred number of slaves, the elite's payoff is:

$$(11) \quad \pi_t^S = \alpha \left[ \frac{1-\alpha}{r} \right]^{\frac{1-\alpha}{\alpha}} \theta A.$$

The population receives the average product on the unenclosed land:

$$(12) \quad m_t^S = \left( \frac{(1-\theta)A}{P_t - R} \right)^\alpha.$$

3.1.4. *Comparing payoffs.* Define:

$$(13) \quad \Psi(P_t) = \left[ \frac{r}{1-\alpha} \right]^{1/\alpha} \frac{\sigma}{\theta} (P_t - R),$$

$$(14) \quad \Omega(P_t) = \left( \frac{1}{\alpha\theta} \right)^{\frac{1}{1-\alpha}} \left( \frac{r}{1-\alpha} \right)^{\frac{1}{\alpha}} (P_t - R)^{-\frac{\alpha}{1-\alpha}},$$

and:

$$(15) \quad \Phi = \frac{1}{\alpha\theta^\alpha\sigma^{1-\alpha}}.$$

These partition the  $(A, P_t)$  space into three sets:

$$(16) \quad \begin{aligned} \mathcal{S}^E &= \{(A, P_t) \in \mathbb{R}_+^2 : (A, P_t) \notin \mathcal{S}^S \cup \mathcal{S}^F\}, \\ \mathcal{S}^S &= \{(A, P_t) \in \mathbb{R}_+^2 : A \geq \max\{\Psi(P_t), \Omega(P_t)\}\}, \\ \mathcal{S}^F &= \{(A, P_t) \in \mathbb{R}_+^2 : P_t \geq \Phi + R \text{ and } A \leq \Psi(P_t)\}. \end{aligned}$$

These define the elite's institutional preferences:

**Proposition 1.** *Elite preferences over the three institutions are determined by  $A$  and  $P_t$  such that:*

*I. Egalitarianism is weakly preferred when:*

$$\pi_t^E \geq \max\{\pi_t^S, \pi_t^F\} \Leftrightarrow (A, P_t) \in \mathcal{S}^E.$$

*II. Slavery is weakly preferred when:*

$$\pi_t^S \geq \max\{\pi_t^E, \pi_t^F\} \Leftrightarrow (A, P_t) \in \mathcal{S}^S.$$

*III. Free labor is weakly preferred when:*

$$\pi_t^F \geq \max\{\pi_t^E, \pi_t^S\} \Leftrightarrow (A, P_t) \in \mathcal{S}^F.$$

*Proof.* (5) and (11) imply that  $\pi_t^S \geq \pi_t^E$  iff  $A \geq \Omega(P_t)$ . (9) and (11) imply that  $\pi_t^S \geq \pi_t^F$  iff  $A \geq \Psi(P_t)$ . (5) and (9) imply that  $\pi_t^F \geq \pi_t^E$  iff  $P_t \geq \Phi + R$ .  $\square$

These regions are depicted in Figure 1. Slavery is preferred when population is large enough that the opportunity cost of coercion is low, but small enough that free labor is expensive. Greater agricultural productivity overcomes the inefficiency of coercion. Population growth pushes down the average product of land, making egalitarianism unattractive.

**3.2. Dynamics.** Population evolves according to:

$$(17) \quad P_{t+1} = n_t^{\text{non-elite}}(P_t - R).$$

Using (3), (5), (8), (12), and (17), population is constant when:

$$(18) \quad A = \begin{cases} \left(\frac{q}{\beta}\right)^{\frac{1}{\alpha}} \left(\frac{P_t}{(P_t-R)^{1-\alpha}}\right)^{\frac{1}{\alpha}} \equiv \mathbf{L}^E(P_t) & \text{if } (A, P_t) \in \mathcal{S}^E \\ \left(\frac{q}{\beta(1-\alpha)}\right)^{\frac{1}{\alpha}} \frac{\sigma}{\theta} \left(\frac{P_t}{(P_t-R)^{1-\alpha}}\right)^{\frac{1}{\alpha}} \equiv \mathbf{L}^F(P_t) & \text{if } (A, P_t) \in \mathcal{S}^F \\ \left(\frac{q}{\beta}\right)^{\frac{1}{\alpha}} \frac{1}{1-\theta} \left(\frac{P_t}{(P_t-R)^{1-\alpha}}\right)^{\frac{1}{\alpha}} \equiv \mathbf{L}^S(P_t) & \text{if } (A, P_t) \in \mathcal{S}^S \end{cases}$$

If  $A > \mathbf{L}^S(P_t)$  under slavery,  $P_t$  is rising. If  $A < \mathbf{L}^S(P_t)$  under slavery,  $P_t$  is falling. If  $A > \mathbf{L}^E(P_t)$  under egalitarianism,  $P_t$  is rising. If  $A < \mathbf{L}^E(P_t)$  under egalitarianism,  $P_t$  is falling. If  $A > \mathbf{L}^F(P_t)$  under free labor,  $P_t$  is rising. If  $A < \mathbf{L}^F(P_t)$  under free labor,  $P_t$  is falling.

Define:

$$(19) \quad A_{\Psi, \Omega}^{\Phi} = \left(\frac{r}{1-\alpha}\right)^{\frac{1}{\alpha}} \left(\frac{\sigma}{\theta\Phi}\right),$$

$$(20) \quad A_{\Phi}^F = \left(\frac{q}{\beta(1-\alpha)}\right)^{\frac{1}{\alpha}} \frac{\sigma}{\theta} \left(\frac{\Phi + R}{\Phi^{1-\alpha}}\right)^{\frac{1}{\alpha}}$$

$$(21) \quad A_{\Phi}^S = \left(\frac{q}{\beta}\right)^{\frac{1}{\alpha}} \frac{1}{1-\theta} \left(\frac{\Phi + R}{\Phi^{1-\alpha}}\right)^{\frac{1}{\alpha}}$$

$A_{\Psi, \Omega}^{\Phi}$  is the level of  $A$  at which  $\Psi(P_t)$  and  $\Omega(P_t)$  intersect  $P_t = \Phi + R$ .  $A_{\Phi}^F$  is the level of  $A$  at which  $\mathbf{L}^F(P_t)$  intersects  $P_t = \Phi + R$ .  $A_{\Phi}^S$  is the level of  $A$  at which  $\mathbf{L}^S(P_t)$  intersects  $P_t = \Phi + R$ . The dynamics in (18) determine what steady states will exist:

**Proposition 2.** *Steady states.*

- I. So long as  $A$  is below a cutoff  $A^E(\alpha, \beta, \theta, q, r, R)$ , there is a steady state under egalitarianism.
- II. If  $A_{\Phi}^F \leq A_{\Psi, \Omega}^{\Phi}$  and  $A$  is above a cutoff  $A^F(\alpha, \beta, \theta, q, r, R)$ , then a steady state under free labor may exist.
- III. If  $A_{\Phi}^S \geq A_{\Psi, \Omega}^{\Phi}$  and  $A$  is above a cutoff  $A^S(\alpha, \beta, \theta, q, r, R)$ , then there is a steady state under slavery.

*Proof.* So long as  $A$  is low enough, it will obviously intersect  $\mathbf{L}^E(P_t)$  in  $\mathcal{S}^E$ .  $A_{\Phi}^F \leq A_{\Psi, \Omega}^{\Phi}$  ensures  $\mathbf{L}^F(P_t)$  is flat enough to intersect  $\mathcal{S}^F$ . If  $A^F$  is chosen as the level of  $A$  at which  $\mathbf{L}^F(P_t)$  intersects  $P_t = \Phi + R$ , above this the intersection of  $A$  and  $\mathbf{L}^F(P_t)$  may occur in  $\mathcal{S}^F$ . Finally,  $A_{\Phi}^S \geq A_{\Psi, \Omega}^{\Phi}$  ensures  $\mathbf{L}^S(P_t)$  is steep enough to intersect  $\mathcal{S}^S$ . If  $A^S$  is chosen as the level of  $A$  at which  $\mathbf{L}^S(P_t)$  intersects  $\Omega(P_t)$ , for any  $A \geq A^S$ , the intersection of  $A$  and  $\mathbf{L}^S(P_t)$  will occur in  $\mathcal{S}^S$ .  $\square$

An example with a steady state under free labor is depicted in Figure 1.

**3.3. Polygyny.** Assume now that “wives” are an input into the production of children. Following Tertilt (2005), the cost of producing  $n_t$  children using  $W_t$  wives is now  $qn_t^2/W_t$ . If the purchase price of a wife is  $b_t$ , the total cost of  $n_t$  children borne by  $W_t$  wives will be  $b_t W_t + qn_t^2/W_t$ . Each member of the elite and of the non-abducted non-elite population has  $h$  sisters who he sells at the market price of  $b_t$ . With a balanced sex ratio,  $h$  would equal 1. Payment of bride price to the brother simplifies the model by removing receipt of bride price as a motivation for fertility.

The cost-minimizing choice of  $W_t$  for an agent taking  $b_t$  as given will be  $\sqrt{(q/b_t)}n_t$ . The cost-minimizing choice of wives implies that there is a linear marginal cost of children equal to  $2\sqrt{b_t q}$ . If an agent has income  $I_t$ , his optimal number of children will be  $\beta I_t/(2\sqrt{b_t q})$ , which implies that his demand for wives is  $\beta I_t/(2b_t)$ . Under institutional  $i$ , elite income is  $\pi_t^i + b_t h$ , while non-elite income is  $m_t^i + b_t h$ . Since the elite has zero mass, total demand in the market for wives is:

$$(22) \quad \frac{\beta}{2b_t} [m_t^i + hb_t] (P_t - R).$$

The total supply of wives is given by  $h(P_t - R)$ . In equilibrium,  $b_t$  is set by the intersection of total demand with total supply, where:

$$(23) \quad b_t^i = \frac{\beta}{(2 - \beta)h} m_t^i.$$

Polygyny exists when the elite has more wives than members of the population, i.e when  $\beta(\pi_t^i + b_t h)/(2b_t) > \beta(m_t^i + b_t h)/(2b_t)$  or  $\pi_t^i > m_t^i$ . The addition of polygyny will not qualitatively change the elite’s preferences over institutions.<sup>7</sup> Under egalitarianism, the elite’s income will be the same as that of the non-elite, and so polygyny will not exist. Under free labor, the condition that  $P_t \geq \Phi + R$  ensures that the elite’s income will be greater than that of the non-elite, and so polygyny will exist. Under slavery, the condition that  $A > \Omega(P_t)$  similarly ensures that the elite has more wives. Inequality is a precondition for polygyny. This is a revision of the land-abundance interpretation of African history.

<sup>7</sup>Under institutional setting  $i$ , if the elite receives income  $\pi_t^i$  and the equilibrium bride price is  $b_t^i$ , the elite’s maximized utility will be equal to:

$$\begin{aligned} V_t^i &= (1 - \beta) \ln(\pi_t^i - 2\sqrt{b_t^i q} n_t^*) + \beta \ln(n_t^*) \\ &= (1 - \beta) \ln(\pi_t^i - 2\sqrt{b_t^i q} \frac{\beta}{2\sqrt{b_t^i q}} \pi_t^i) + \beta \ln(\frac{\beta}{2\sqrt{b_t^i q}} \pi_t^i) \\ &= \ln(\pi_t^i) - \frac{\beta}{2} \ln(b_t^i) + K, \end{aligned}$$

where  $K$  is a constant. Thus, institution  $i$  will be preferred to institution  $j$  if  $V_t^i \geq V_t^j$ , or:

$$\begin{aligned} \ln(\pi_t^i) - \frac{\beta}{2} \ln(b_t^i) &\geq \ln(\pi_t^j) - \frac{\beta}{2} \ln(b_t^j) \\ \Rightarrow \frac{\pi_t^i}{\pi_t^j} &\geq \left(\frac{b_t^i}{b_t^j}\right)^{\frac{\beta}{2}}. \end{aligned}$$

From (23),  $b_t^i/b_t^j = m_t^i/m_t^j$ . The ratios  $m_t^i/m_t^j$  are constants independent of  $A$  and  $P_t$ . While the definitions of  $\Phi$ ,  $\Omega$ , and  $\Psi$  must be adjusted to include these constants, their general shapes will not change.

3.4. **Two tests of the model.** Two implications of the model are tested in Section 4:

- I. Increasing (exogenous)  $A$  predicts the existence of slavery, polygyny and rights over land.
- II. Polygyny and land rights exist when (endogenous)  $P_t$  is high; slavery exists at intermediate  $P_t$ .

Rights over land and polygyny exist under both slavery and free labor.  $A \geq A^F$  is necessary for a steady state to exist under free labor. Since  $A^F$  is a nonlinear function of model parameters that are not observed in the data, a matrix of geographic controls  $X$  is used to proxy for  $A^F$  by assuming:

$$(24) \quad A^F \approx \frac{1}{\delta_0}(-X'\lambda_0 - \epsilon_0),$$

where  $\delta_0$  and  $\lambda_0$  are regression coefficients and  $\epsilon_0$  is an error term. The probability that a steady state exists under free labor (i.e. with land rights and polygyny) is:

$$(25) \quad \Pr(\text{Steady state in } \mathcal{S}^F) = \Pr(\epsilon_0 \geq -\delta_0 A - X'\lambda_0).$$

If  $\epsilon_0 \sim N(0, 1)$ , this can be estimated as a probit. Similarly,  $A \geq A^S$  is necessary for a steady state to exist under slavery. Following similar logic, the probability of a steady state with slavery is:

$$(26) \quad \Pr(\text{Steady state in } \mathcal{S}^S) = \Pr(\epsilon_1 \geq -\delta_1 A - X'\lambda_1).$$

Again, if  $\epsilon_1 \sim N(0, 1)$ , this can be estimated as a probit.

Land rights and polygyny exist under free labor and slavery, i.e. when  $P_t \geq \min\{\Phi + R, \Omega^{-1}(A_t)\} = \min\{\Phi + R, \Omega^{-1}(A, A_0, P_0, t)\}$ . Again using  $X$  as a proxy, the probability that land rights or polygyny exist for an observed  $A$  and  $P_t$  is:

$$(27) \quad \Pr(\text{Land Rights, Polygyny}) = \Pr(\epsilon_2 \geq -\delta_{2i}P_t - \delta_{2ii}A - X'\lambda_2).$$

If  $\epsilon_2 \sim N(0, 1)$ , this can be estimated using a probit. Finally, if  $A_t$  is large enough, slavery will exist when  $\Psi^{-1}(A_t) \geq P_t \geq \Omega^{-1}(A_t)$ . Using  $X$ , this is equivalent to stating that slavery exists if:

$$(28) \quad \delta_{3i}P_t + \delta_{3ii}A + X'\lambda_3 + \epsilon_3 \geq 0 \text{ and } \delta_{4i}P_t + \delta_{4ii}A + X'\lambda_4 + \epsilon_4 \geq 0.$$

If  $(\epsilon_3, -\epsilon_4) \sim N(0, \Lambda)$ , this is the Poirier (1980) partially unobserved bivariate probit model. However, because this could not be implemented on the actual data, the tests used look for an inverted-U relationship between population density and slavery.<sup>8</sup>

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<sup>8</sup>There are no elements of  $X$  that can be excluded *a priori* from either of the two equations in the partially unobserved bivariate probit model. Without an exclusion restriction of this type, the model may not be identified on actual data, as is the case with the data used below.

#### 4. CROSS-SECTIONAL EVIDENCE

This section implements both tests of the model described in Section 3.4. The model correctly predicts the existence of land rights, slavery and polygyny where  $A$  is highest, and land rights and polygyny are positively correlated with population density. Slavery, however, is positively related to population density – it does not exist only at intermediate levels. This may be understood within the model as due to Africa’s disease environment or to its overall sparse population, as discussed below. Section 4.1 describes the data used and presents summary statistics. Section 4.2 lays out the empirical strategy, and Section 4.3 presents the results.

**4.1. Data.** Two types of data are used to test the ability of the model to explain institutional differences across societies within Africa. The first is Murdock’s (1967) *Ethnographic Atlas*. Published in 29 installments of the journal *Ethnology* between 1962 and 1980, the Atlas is a database of 1267 societies from around the world.<sup>9</sup> It contains categorical variables describing several institutional and cultural features of these societies at the time of first contact with Europeans. 531 African societies are used for the analysis.<sup>10</sup>

Six variables from the Ethnographic Atlas are used to construct binary dependent variables, and summary statistics for these are given in Table 3.<sup>11</sup> Indicators are used for whether any land rights or slavery exist. Two measures are used for polygyny. The first is a direct indicator for whether polygyny exists. Because there is not much variation in this outcome, “willingness to pay” for wives is measured by using an indicator for whether consideration is given in return for a bride (a non-token bride-price, labor service, or another female relative). Two measures are used of state power – whether there is more than level of jurisdiction above the local (“state stratification”), and whether class stratification exists among freemen.

The second type of data used includes features of the natural environment. These are joined to the data from the Ethnographic Atlas using the “Tribal Map of Africa” from Murdock (1959). Sources, definitions, and details of the matching procedure are given in Appendix A. Summary statistics are presented in Table 3. Two of these controls are of particular importance. The first, agricultural suitability, is based on Fischer et al.’s (2002) measure of combined climate, soil and terrain slope constraints. This is re-scaled to lie between 0 and 1, with larger values indicating an absence of environmental constraints on agriculture. This is treated as a proxy for the variable  $A$  in

<sup>9</sup>A revised version of the Atlas has been made available for download in SPSS format by J. Patrick Gray at <http://eclectic.ss.uci.edu/~drwhite/worldcul/EthnographicAtlasWCRevisedByWorldCultures.sav>. This is the version used for the present study.

<sup>10</sup>The Guanche, an extinct people of the Canary Islands, are dropped because they are observed more than 300 years earlier than any of the other groups in the African sample barring Ancient Egypt, which is similarly dropped. Dates of observation are missing for the Bomvana and Betsileo. The Bomvana are recoded to 1850, to match the date of observation for the other Xhosa, while the Betsileo are recoded to 1900, the modal date for the other Malagasy societies in the data.

<sup>11</sup>These are: V74: Inheritance Rule for Real Property (Land); V70: Type of Slavery; V6: Mode to Marriage (Primary); V9: Marital Composition: Monogamy and Polygamy; V33: Jurisdictional Hierarchy Beyond Local Community, and; V66: Class Stratification. The definitions of the binary variables are: 1) Land rights exist if  $V74 \neq 1$ , 2) slavery exists if  $V70 > 1$ , 3) polygyny exists if  $V9 \neq 1$ , 4) consideration for bride exists if  $V6=1$  or  $V6=2$  or  $V6=5$ , 5) state stratification exists if  $V33 > 2$ , and 6) class stratification exists if  $V66 > 1$ .

the model. The second is population density in 1960, published by the United Nations Environment Programme. This is treated as a proxy for  $P_t$  in the model.<sup>12</sup> These are plotted on in Figure 2.

The other controls listed in Table 3 are included as proxies for the unobserved cutoffs described in Section 3.4. These are nonlinear functions of  $\alpha$ ,  $\beta$ ,  $q$ ,  $r$ , and  $\theta$ . Elevation is related to the disease environment, and hence the cost of children ( $q$ ). It also affects the range of available crops and technologies, and hence  $\alpha$ . McCann (1999, p. 38-39), for example, notes that the Ethiopian highlands were a unique source of crops such as teff and supported both animal husbandry and use of the plough. Precipitation determines what crops can be grown, shaping  $\alpha$ . African growing seasons and diseases are constrained by the seasonal availability of moisture (McCann, 1999, p. 15-18). Areas with low rainfall are also those most susceptible to drought (Bloom and Sachs, 1998, p. 222);  $\beta$  and  $r$  accounting for storage needs will be greater.

Temperature affects the physical cost of effort (Landes, 1998, p. 4), and hence  $r$  and  $\beta$ . In hostile environments, it is more difficult for slaves to flee;  $r$  is lower.<sup>13</sup> Temperature affects  $q$  through nutrition and disease (Bloom and Sachs, 1998, p. 228). Distances from the coast and from Lake Victoria proxy for water-borne diseases that affect  $q$  (e.g. Miguel and Kremer (2004)). These distances also capture the presence of trade, which affects both  $\alpha$  and  $\beta$  through what goods are bought and sold, and the cost of slavery ( $r$ ) through what uses exist for slaves and whether they can be punished by sale for export (Lovejoy, 2000, p. 4). Proximity to markets also affects the benefit of children (hence  $\beta$ ) through their use as substitutes for insurance and savings (Bloom and Sachs, 1998, p. 249).

The suitability of the environment for malaria affects  $q$  through child mortality and  $r$  via slave mortality. It may also alter the physical cost of effort in adults (Gallup and Sachs, 2001, p. 94-95). Suitability for tsetse makes the survival of draught animals and cattle difficult, shaping  $\alpha$ . Kjekshus (1977, p. 51) writes that the “overwhelming feature in the study of cattle-keeping in East Africa is the presence of the tsetse fly.” Trypanosomiasis also affect human mortality, and hence  $q$ , and the ability to use cavalry (and thus  $r$ ). Webb (1995) cites this as a decisive factor in the history of the Western Sahel. Ruggedness, following Nunn and Puga (2007), is related to the cost of capturing slaves, and hence  $r$ . Crop dummies are taken as exogenous determinants of the available technologies ( $\alpha$ ). Absolute latitudes north and south of the equator and the date at which the society was first observed are also included as controls.

**4.2. Specification.** The first prediction of the model is that raising  $A$  will make it possible for steady states to exist with land rights, polygyny, or slavery. This is tested by estimating:

$$(29) \quad y_i = \delta_r + \beta_A A_i + X_i' \gamma + \epsilon_i,$$

<sup>12</sup>This is reasonable insofar as the relative distribution of population within Africa has been stable over time across regions as large as those used as observations. Population density in 1960 and 2000 have a correlation coefficient of 0.92 and their logs have a correlation coefficient of 0.97, which suggests that this is a fair assumption. All regressions also account for the date of observation, which will capture growth effects.

<sup>13</sup>Isaacman et al. (1980, p. 598) makes a similar point in discussing the difficulties faced by refugees who fled colonial rule in northern Mozambique.

where  $y_i$  is an outcome of interest for ethnic group  $i$ ,  $\delta_r$  is a vector of dummies for the fifteen regions in the Ethnographic Atlas,  $A_i$  is the measure of agricultural suitability based on Fischer et al. (2002),  $X_i$  is a matrix of geographical controls, and  $\epsilon_i \sim N(0, 1)$  is random error. (29) is estimated as a probit, and observations are weighted by estimated population in 1960. This is done to avoid giving smaller groups undue influence in the results. Standard errors are clustered by region. I expect that  $\beta_A > 0$  for land rights, slavery, and polygyny.

The second implication of the model is that land rights and polygyny exist at higher levels of  $P_t$ , while slavery exists at intermediate levels of  $P_t$ . These are tested by estimating:

$$(30) \quad y_i = \delta_r + \beta_P \ln(P_i) + \beta_A A_i + X_i' \gamma + \epsilon_i,$$

and

$$(31) \quad y_i = \delta_r + \beta_{P1} P_i + \beta_{P2} P_i^2 + \beta_A A_i + X_i' \gamma + \epsilon_i,$$

where  $y_i$ ,  $\delta_r$ ,  $A_i$ ,  $X_i$ , and  $\epsilon_i$  are defined as in (29).  $P_i$  is population density in 1960. These are also estimated as probit models, with observations weighted by estimated population and standard errors clustered by region. I expect that  $\beta_P > 0$  for land rights,  $\beta_P > 0$  for polygyny and the cost of wives, and that  $\beta_{P1} > 0$  and  $\beta_{P2} < 0$  for slavery.

Finally, a test for neighbor effects is implemented by estimating a spatial autoregressive (SAR) model:

$$(32) \quad y_i = \alpha + \rho W_i y_{i-1} + \beta_A A_i + X_i' \gamma + \epsilon_i.$$

Here,  $\alpha$  is a constant,  $W_i$  is an  $N \times N$  spatial weight matrix, in which each entry  $W_{ij}$  is an indicator for whether observation  $i$  borders observation  $j$ , normalized so that its rows sum to 1 or 0.  $y_{i-1}$  is a vector of outcomes for the other observations.  $\rho$  captures whether the institutional outcome of one group will affect its neighbor's institutions.  $\rho$  may alternatively be interpreted as a measure of localized unobservables. Because of the spatial lag, standard probit estimates will be inconsistent. The model is estimated using the Markov Chain Monte Carlo SAR probit estimator described by LeSage and Pace (2009, p. 283-289).

**4.3. Results.** Table 4 presents estimates of (29), (30) and (31). Table 5 gives estimates of (32). Results are discussed by type of outcome.

**4.3.1. Land Rights.** As predicted by the model, an increase in  $A$  predicts the existence of rights over land. When only the proxy  $A_i$  and a dummy for the North and Saharan regions (taken together) are included, the estimated coefficient on  $A_i$  is positive and significant. As more controls and regional dummies are included, the estimated coefficient on agricultural suitability becomes larger. 36 observations are lost, because all societies for which trees are their principal crop have land rights. This suggests that the significance of the results is not due to correlation of agricultural suitability with other unobservable variables that make the existence of land rights more likely. If these unobservable features have similar correlations with agricultural suitability as the observable



variables, including them would strengthen the estimated effect of agricultural suitability on land rights (Altonji et al., 2005). The results concerning  $P_t$  also confirm the predictions for land rights. This is not a causal effect; as an endogenous variable, it is correlated with land rights as the model predicts. The estimate of  $\rho$  is negative. A society with land rights discourages its neighbors from having rights over land. In the model, if neighbors switch from egalitarianism to slavery, creating rights over land in their own societies, this will increase  $R$ . This raises the population threshold above which free labor is preferred to slavery, because more people are drawn out each period. An explanation from outside the model is that, if secure rights encourage in-migration, this will depopulate neighboring regions, delaying the development of land rights in these.

4.3.2. *Slavery.* The model’s predictions for slavery confirm a restricted version of the model. While the point estimate on  $A_i$  is positive when only a North/Sahara dummy is included, it is not significant. Once other controls and regional dummies are added, this effect grows in magnitude and becomes significant, supporting the predictions of the model. This suggests that agricultural suitability is correlated with both observed and unobserved features that make slavery less likely, and so the estimated impact is not due solely to omitted variables bias. While the log of population density is positively correlated with the existence of slavery, there is no significant quadratic correlation of slavery with population density.<sup>14</sup> This need not imply a rejection of the model, for two reasons. First, the disease environment in Africa may be so severe, and  $q$  so high, that the zero-population growth locus  $\mathbf{L}^F(P_t)$  is too steep to intersect the free labor region,  $\mathcal{S}^F$ . Population simply cannot grow to the point where free labor replaces slavery. Second, Africa is sparsely populated. There may not be enough densely-populated societies in the data with relatively low agricultural suitability to identify the relationship statistically. Both of these fit very well with the land abundance view of African history. Positive spill-overs exist in slavery; if a society uses slaves it encourages its neighbors to do the same. This may be because it is more difficult for a slave to escape to a neighboring slave society, lowering  $r$ . It may also, outside the model, reflect the military value of slaves and the need for a society to defend itself from neighboring militarized societies.

4.3.3. *Polygyny.* As in the extension in Section 3.3, both payment of consideration for a bride and the existence of polygyny are more likely in locations where agricultural suitability is high. 38 observations are gained for payment of consideration in the second column because all societies in the North or Sahara offer more than a token price for wives. 86 are lost for polygyny since all societies cultivating roots and tubers are polygynous. Both are positively correlated with population density, though this is not significant. This runs contrary to the conventional arguments in the literature on African history, particularly those of Goody (1969) and Tambiah and Goody (1973). Inequality between men is a precondition for polygyny, and so the positive correlation between class stratification and population density suggests that polygyny and payment of bride-price are not possible in the most egalitarian, sparsely-settled societies. The impact of agricultural suitability disappears (though it is still marginally present for the payment of consideration) in the spatial regressions because these results are sensitive to the weighting of observations; this is not surprising,

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<sup>14</sup>I have also tested whether population splines or quantiles reveal a significant inverted-U pattern in groups of 3, 5 and 10. They do not, and these results are not reported.

given the lack of variation in these outcomes. There is no evidence that marital institutions show correlation across space.

4.3.4. *State Power.* Neither state nor class stratification are related to  $A_i$ ; while both measures of state strength are correlated with population density, intrinsic agricultural productivity does not appear to be one of their systematic determinants. Validating Herbst (2000), population density is positively correlated with both measures of state strength. State and class stratification display positive neighbor effects. This may reflect the need for societies to defend themselves against their organized neighbors. This may also be due to direct institutional spillovers. Oral tradition, for example, states that the institution of kingship was transferred directly from Ife to Benin during the thirteenth century (Ryder, 1965). Similarly, the formation of the Swazi and Lesotho states was a direct response to the rise of Zulu power during the *mfecane* (Maddox, 2006, p. 114).

In sum, the model correctly predicts that land rights and polygyny existed in pre-colonial Africa where population and agricultural suitability were greatest. As in the model, slavery existed where agricultural suitability was high, but population was positively correlated with slavery. This is consistent with the literature’s characterization of Africa as land abundant. Population could not expand in the African environment to the point where free labor would replace slavery. While state power was correlated with population density, its existence was not systematically based on agricultural suitability.

## 5. EVIDENCE FROM ONE SOCIETY

The model in Section 3 and the statistical evidence in Section 4 have shown that land abundance is a powerful tool for explaining differences in institutions across societies in pre-colonial Africa. This section traces the implications of land abundance in a particular Nigerian society, the Egba, over the period 1830 to 1914. This permits for a more nuanced understanding of what institutions such as land rights and slavery entailed in practice. Since longitudinal data on institutions in pre-colonial Africa do not exist, looking at one society allows the development of institutions to be traced over a long period. Other features of Egba society can be interpreted in terms of model parameters.

Section 5.1 provides historical background. Section 5.2 outlines the sources used. Section 5.3 describes property rights in land; these were poorly defined, while markets for land were thin. The exceptions to this pattern – land sales and land disputes – are also discussed in this section. Section 5.4 turns to labor, noting the absence of a market for free labor, the use of slaves, and the importance of wives and dependents. Section 5.5 looks at capital, noting the difficulty in borrowing without land as collateral. This was eased after 1890 by the arrival of cocoa and kola.

**5.1. Historical Background.** The Egba are a Yoruba-speaking group, presently located in the central portions of Ogun State. These are depicted in Figure 3. The Egba settled as refugees at the site of Abeokuta in 1830, and remained formally independent from British rule until 1914. Political

power before 1914 lay at the more decentralized level of the township,<sup>15</sup> and was divided among the the *olorogun* (war chiefs), *ogboni* (civil chiefs), *ode* (hunters), and *parakoyi* (trade chiefs).

In the mid-nineteenth century, the Egba cultivated maize, cotton, yams, cassava and beans, supplementing these with other crops.<sup>16</sup> These were intercropped and planted in heaps.<sup>17</sup> Palm products were their principal exports, and the Egba were among the first Yoruba groups to become involved in this trade.<sup>18</sup> Cocoa spread from Lagos after 1890 due to the efforts of merchants and demobilized soldiers seeking new opportunities.<sup>19</sup> Many early planters were Christians, supported by evangelists, Lagos businesses, and Agege planters such as J.K. Coker, who had a 2,000 acre farm and employed more than 200 laborers.<sup>20</sup> Kola trees were also introduced through Lagos by repatriated slaves and Lagos Christians, with British encouragement.<sup>21</sup>

Situated close to Lagos, the Egba were important in the nineteenth century trade and politics of the city, and were an early focus of missionary efforts.<sup>22</sup> The representatives of the Egba United Government (EUG)<sup>23</sup> highlighted the peculiar institutional development of the Egba in their testimony to the West African Lands Committee (WALC) in 1913 by giving answers different from the other Yoruba representatives, in particular claiming that sale of land was a long-standing custom.<sup>24</sup> Mabogunje (1961) attributes this to the unusual settlement pattern of the Egba, who began as a densely populated group of refugees and expanded slowly outwards from Abeokuta over the next seventy years.

**5.2. Sources.** Court records are a commonly used source for economic historians and Africanists.<sup>25</sup> They make it possible to go beyond the idealized descriptions of institutions given other sources and observe how they worked in practice. I have collected data on 541 Native Court cases involving farmland that took place between 1902 and 1919.<sup>26</sup> In addition, missionary records, travelers'

<sup>15</sup>The Egba townships correspond roughly to the villages occupied by the Egba before their removal to Abeokuta. Estimates of the number of these townships vary; Burton (1863, p. 170) gives 150; Ajisafe (1924, p. 18) writes "not less than three hundred"; Johnson (1921, p. 93) states 153; Fadipe (1970, p. 48) gives 145, Stone (1900, p. 38) gives 110, and Ward-Price (1939, p. 87) states 70.

<sup>16</sup>See Barber (1857, p. 100), Burton (1863, p. 62) and Delany (1861, p. 33).

<sup>17</sup>Burton (1863), p. 62.

<sup>18</sup>Lynn (1997), p. 41.

<sup>19</sup>Berry (1975), p. 51.

<sup>20</sup>Agiri (1972), p. 164.

<sup>21</sup>Agiri (1977), p. 7-8.

<sup>22</sup>Tucker (1853)

<sup>23</sup>The central government of the independent Egba from 1893 to 1914; the name "Egba United Government" was not adopted until 1898.

<sup>24</sup>Mabogunje (1961), p. 258.

<sup>25</sup>See, for example, Dickerman (1984), Chanock (1985), Dickerman et al. (1990), Mann and Roberts (1991), Moore (1986), Ogilvie (2003), or Roberts (2005).

<sup>26</sup>Two sets of Native Court records are used for this study. The first is taken from the Egba Council Records (ECR) deposited in the National Archives, Abeokuta (NAA), and contains Civil and Criminal Record Books mostly from the period 1899-1904. The second is housed in the Hezekiah Oluwasanmi Library at Obafemi Awolowo University, Ile-Ife. From this collection, I have used Civil Judgment Books from the Ake "A" and "B" Grade Courts, the Ake Central Court, the Abeokuta Mixed Court, and the Abeokuta Native Court of Appeal. Other cases from these collections (for example, suits relating to urban land, manumission certificates or divorce) are cited in the text, but not included in the sample used for the quantitative analysis.

Histories of the Native Courts have been provided by Adewoye (1977) for Southern Nigeria as a whole and Pallinder-Law (1974) (specifically, p. 84-87, 106-113, 123-127, 133, 142-146, and 152-153) for Egbaland. Before 1904, the court

descriptions, official correspondence and private letters are used as sources of historical evidence; these are taken from published sources, the Church Missionary Society (CMS) Archive, the Rhodes' House Library (RHL), the National Archives of the UK (NAUK), and the National Archives of Nigeria in Ibadan (NAI) and Abeokuta (NAA). Ten elderly Egba men and women also served as informants.<sup>27</sup>

Summary statistics for the court cases are presented in Table 6. Only two thirds of the case records are complete.<sup>28</sup> Events are mis-counted due both to disputants' selective presentation of facts and to this incompleteness. In trespass cases, the amount claimed is for the damage done, while in recovery cases it is for the entire value of the land. Cocoa had been planted on roughly a quarter of the plots, and kola was planted on little over a tenth. Many plots had been pawned at some point in their history, and more than a tenth had been sold. This last measure is problematic, since "sale" is used as an accusation of wrongdoing and as another word for pawning.

Several strategies for defending claims are also evident in Table 6; boundaries were either made by the participants, the township chiefs, or the "villagers." Many disputes were taken to the chiefs before coming to court. Jujus (objects with supernatural power) such as *aya* or *mariwo* were placed in a farm to prevent other parties from entering; these provided a signal that the land was under dispute, and a fear of supernatural punishment if ignored. An opponent could also be driven from the land. This is a selected sample, and so these numbers are clearly not representative of all Egba farms. Still, it is clear that by 1919 the cocoa boom was underway, pawning of land was common, sale of farm land existed, and Egba farmers used a variety of strategies to defend their claims.

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records that survive consist of the Alake and council of the EUG exercising their judicial authority. While courts for each of the four Egba sections were established in 1901, the non-Ake courts were abolished in 1904. The Ake court was then moved into a new building, to lessen the Alake's influence over its decisions. Cases used for this study from 1904 and later are primarily from this court. Its judges were literate Egba, appointed by the EUG (by the Egba Native Authority after 1914), and it had both civil and criminal jurisdiction. It is clear from the records that the courts, while empowered to enforce unwritten "native law and custom," followed a judicial process that was "essentially arbitrational, aimed at restoring harmony by negotiating a settlement acceptable to both parties" (Pallinder-Law, 1974, p. 84). If both litigants were closely related, the court might remit the case to be settled amicably "at home." Similarly, while "private" courts were ostensibly illegal, it is clear that the *ogboni* (civil chiefs) continued to hear the majority of cases, and that only those they could not settle were taken to the Ake court in Abeokuta. The Alake was frequently accused of interfering in the court's operation before 1914.

A typical record begins by noting the names of the litigants and either their home villages or township affiliations, as well as the number of the case. A complete record has been transcribed as Appendix B. The plaintiff's cause of action and claim for damages are also given in the header, alongside the farm's location (e.g. "at Kori Ogude"); the majority of claims are for either recovery of farmland or damages for trespassing and reaping crops. The testimony is recorded in English longhand, though it is likely the participants spoke mostly in Yoruba. The judgments delivered usually range from a sentence to a short paragraph, stating how the land is to be divided and what damages are to be paid.

<sup>27</sup>These interviews were conducted, recorded and translated from Yoruba by Joseph Ayodukun. Transcripts of these interviews are available upon request. Because the time period of this study predates living memory, these capture oral tradition and normative rules more than historical fact.

<sup>28</sup>Cases are often adjourned so that parties can call further witness or so that the land can be "inspected." Available records are frequently incomplete, since a case may be resumed in another judgment book which no longer survives, or may be continued from a similarly non-extant book. Inspection of the land enters the court records only as the verbal report of the officer who conducted it. At these public meetings, "villagers," elders and chiefs were called to give evidence and identify boundaries. The court invariably takes the reports of these examinations as declarations of fact.

5.3. **Land.** In 1911, Lugard estimated that the whole of the Egba Division had an area of 1869 square miles and a population of 265,000 - a density of 142 per square mile.<sup>29</sup> This is less dense than present-day Côte d'Ivoire or Kenya. Even at this intermediate density, free land was accessible to independent farmers, who cultivated fewer than five acres annually.<sup>30</sup> In 1877, the missionary James Johnson reported that individuals could acquire land for farming freely if they developed it from forest, or in return for token payments.<sup>31</sup> Grants were traditionally either *tito*<sup>32</sup> or *fifun*. If the gift was *tito*, the owner of a piece of “virgin” forest received presents from the grantee. When the recipient cleared the forest, he became its absolute owner.<sup>33</sup> Although clearing required labor (Forde et al. (1946, p. 92, 113-114) estimate 48 to 92 man-days per acre), this was spread out over the first three years. Trees were burned after felling, with the roots left in place, and two maize crops could be planted during the first year.<sup>34</sup> The Yoruba proverb that “a farmer’s period of hunger is three months” (the length of time needed for the first maize crop to mature) is evidence that clearing costs were not an insurmountable barrier to taking new land from forest.<sup>35</sup> A man who wished to take forest in his own village could call on the help of one of the co-operative work groups described in Section 5.4. A migrant would receive a *fifun* grant of already cleared land known as *igboro* or *irapa*. Under the rules of the *mawoke* (“don’t look up”) system, he was not permitted to plant permanent crops, to reap the fruit of trees on the land, or to alienate it.<sup>36</sup> Fadipe (1970, p. 176) states that *fifun* grants were intended to be temporary, enabling the recipient “to have the means of subsistence at his disposal, with the minimum delay, while the forest land that was granted him was being cleared and prepared for cultivation.”

The payments given for such grants were typically small, and the descriptions given by Folarin (1939, p. 74-75), Partridge (1911, p. 428-433), or Lloyd (1962, p. 262-267) make them appear more formal than they actually were. Statements in the court records rarely state that any conditions were attached; the grant to Lukosi in Appendix B is an example. Even for planting cocoa or kola, land could be acquired virtually without cost. Early planters obtained their land without payments, before the owners were aware of its value. After 1885, many Lagos Egba often obtained free grants from the landowning families near Agege and Ilu.<sup>37</sup> While Ward-Price (1939, p. 90-93) reported that land for planting cocoa sold at roughly £3 and two bottles of gin per acre during the 1930s, much had already been given away and the chiefs could no longer obtain any revenues from it.<sup>38</sup> Many migrants chose to plant at Otta because an individual could farm a piece of land

<sup>29</sup>WALC (1916a), p. 24.

<sup>30</sup>The Olofin of Ilogbo estimated that his subjects cultivated three acres each in 1902 (NAUK, CO 147/162, enc in 20 Oct, 1902: Acting Governor to Chamberlain).

<sup>31</sup>Agiri (1974), p. 467.

<sup>32</sup>Partridge (1911, p. 429) uses the term *Egan*, meaning “forest”.

<sup>33</sup>Folarin (1939), p. 74.

<sup>34</sup>Ant (1902), p. 319.

<sup>35</sup>Fadipe (1970), p. 177.

<sup>36</sup>Folarin (1939), p. 74-75.

<sup>37</sup>NAI, Fowler “A Report on the Lands of the Colony Districts,” p. 30.

<sup>38</sup>All money values are nominal. Following the UK retail price index from EH.net, the retail price index in Britain over the course of this study started at 96.55 in 1830, ended at 102.5 in 1914, bottomed out at 83.81 in 1851, and peaked at 112.95 in 1867. Misstatements of value due to the use of nominal values will be less than 20% in either direction. The notation used is the standard notation that was used for pounds, shillings, and pence before the pound

while serving a master and obtain ownership of a plot if he settled permanently.<sup>39</sup> One interviewee reported that when his grandfather obtained land at Ilogbo all that had been asked for was prayer wine.<sup>40</sup>

This section discusses the evidence that Egba land use and tenure were driven by the abundance of land. The market for land was thin. Agriculture economized on labor and few investments were made. Property rights were ambiguously defined. Land sales and disputes, however, both existed. Mabogunje (1958, 1959, 1961) has argued that Egba land tenure was altered by their settlement pattern; his argument is reinterpreted here as a response to changes in the land-labor ratio. In addition, even as land in general was abundant, specific pieces of land had particular value.

5.3.1. *Thin land markets.* Because land was cheaply available, markets for it were thin. Burton (1863, p. 96), after visiting Abeokuta in 1860, wrote that there were two ideas “incomprehensible to Europeans, but part and parcel of the African mind. The first ... is that a slave-born man is a slave for ever. The second is the non-alienation of land.” In an 1878 schedule of property for the CMS Yoruba Mission,<sup>41</sup> none of the land held in Egba territory was declared to have any value apart from the buildings on it. At Osiele, it was noted that “land property cannot be estimated here as to the value, because the practice of selling land is not customary in this village.” While Egba officials were testifying that land sales were a long-standing custom, many Egba questioned their legitimacy. The defendant in a 1905 suit<sup>42</sup> stated that “we Arawo people refused to see any of our land sold, we agree that any body can till the ground but not to sell it.” Similarly, the inspecting officer in a 1915 case told the court that “Itoko people have objection to their lands being sold.”<sup>43</sup> The terms on which land was leased to the British also reflected its low market value; in 1914, the colonial government held ten plots of land on lease from the Egba Native Authority totalling a little over 26,000 acres and on which annual rents were below £600 – less than a shilling an acre.<sup>44</sup>

5.3.2. *Extensive agriculture.* Egba agriculture economized on labor but not on land. Land was cultivated for five or six years, followed by five to six years of fallow, and then two or three more years of cultivation before a long fallow of up to twenty years.<sup>45</sup> Besides cocoa and kola, there were no fixed investments made and no fertilizers used. Crop rotations in which maize and yams gave way to water-yams during the end of the cultivation cycle adapted to deteriorating productivity rather than restoring it.<sup>46</sup>

When a plot was exhausted, it was common for farmers to relinquish their claims and rely on the memories of those left behind in order to reassert them years later. In one suit, the defendant Oyedele had been a small child when compelled to leave the farm during the Ado war.<sup>47</sup> He

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was decimalized in 1971. £1/2/3 denotes one pound, 2 shillings (s), and 3 pence (d). £1/2 denotes one pound, two shillings. 1/2 denotes one shilling, two pence. £1 denotes one pound. 2s denotes two shillings. 3d denotes 3 pence.

<sup>39</sup>Agiri (1972), p. 176.

<sup>40</sup>Chief M. O. Adeyinka, Odofo of Africa General Totoro, 26 July, 2007. No 1 Totoro Street, Owu Abeokuta.

<sup>41</sup>CMS, CA2/O14 Buildings and Property.

<sup>42</sup>Ake Central Suit 209/1905.

<sup>43</sup>Abeokuta Civil Suit 403/1915.

<sup>44</sup>NAUK, CO 583/10, enc. in Feb 16, 1914: Lugard to Harcourt

<sup>45</sup>NAUK, CO 147/162, enc. in 20 Oct, 1902: Acting Governor to Chamberlain.

<sup>46</sup>Dennett (1910), p. 141.

<sup>47</sup>Ake “A” Civil Suit 235/1917. There was more than one Ado war; this was likely c. 1843 or 1853.

returned around 1909, and came with a case of gin asking to be shown his father's land. On finding it occupied, he, according to the plaintiff, "began to point to any farm he met by the way, all which he called his father's when he was corrected by an old pawn of his father ... who took him to the old site of his father's farm which had long been taken by Itoko chiefs."

One strategy for retaining control of abandoned land was to grant usufruct rights (such as reaping palm nuts) to a "caretaker." With time, however, the plot could fall into the hands of the caretaker or his children. In a 1915 suit, the plaintiff Lawani had left land with the defendant's father, a half-brother. The defendant's father planted kola trees prior to 1895.<sup>48</sup> Though he had stated he was "prepared to give pltf [plaintiff] out of it," his daughter (the defendant) refused to honor the promise. The court divided the land, ordering the plaintiff to compensate the defendant for the kola trees that ended up in his possession.

5.3.3. *Weakly defined land rights.* With land freely available and extensive cultivation techniques, property rights over land were poorly defined and rarely permanent. This was striking to Europeans. Clarke (1871, p. 259) wrote that land was "held by possession and only so long as cultivated unless it is vacated with a reserved right."<sup>49</sup> Campbell (1861, p. 35) recorded his impressions in greater detail:

The tenure of property is as it is among civilized people, except as to land, which is deemed common property; every individual enjoys the right of taking unoccupied land, *as much as he can use*, wherever and whenever he pleases. It is deemed his property as long as he keeps it in use; after that, it is again common property.

Clarke (1871, p. 260) described Yoruba farms as having the "unbroken appearances of a single field," as no fences were used and only a "small path" might exist to show where one farm ended and another began. In actual fact, natural features such as streams and roads were taken as boundaries, and *porogun* trees were planted as markers. These were not generally placed, however, until a dispute had already arisen. Otherwise, it was not worthwhile. Egba land tenure was not put down as a coherent set of rules until it became important to do so in negotiations with British officials. Johnson (1921, p. 95-97), in his nationalist history, wrote that the "land laws of the Yoruba country are simple and effective, there being no need of any complicated or elaborate laws," while admitting that these were "to be observed rather in the spirit than in the letter."

The process by which land disputes were resolved was informal and often indeterminate. Generally, the *bale* (village head) was responsible for disputes arising within his compound.<sup>50</sup> His authority depended on his personality and was exercised in consultation with other household members.<sup>51</sup> Interviewees suggested that the importance of the *bale* (village head) derived from his knowledge of the land in question and his personal authority:

<sup>48</sup>Abeokuta Civil Suit 578/1915.

<sup>49</sup>See Stone (1900, p. 21) for a similar observation.

<sup>50</sup>Stone (1900), p. 28.

<sup>51</sup>Blair (1937), p. 16.

For household head it is usually the oldest which is believe to know the history of the settlement and what belong to who in the settlement than anybody therefore his statement about land is held as final.<sup>52</sup>

If the parties were not satisfied with the *bale's* (village head's) intervention, they could go to the township chiefs, relegating the *bale's* (village head's) role to that of arbitrator.<sup>53</sup> In nearly a quarter of the sample cases, a previous attempt at settlement had been made before the local chiefs. Disputes were not settled decisively, but were instead subject to ongoing renegotiation.

5.3.4. *Land sales and land disputes.* Although land markets were thin, the existence of land sales was noted before the WALC. Similarly, some land was valuable enough to be disputed in court. Mabogunje (1958, 1959, 1961) links the existence of land sales to the conditions under which Abeokuta was settled in 1830 and the area around it occupied over the next century. During the initial scramble for land, townships were asked to waive their rights so that newcomers could settle, disrupting *ogboni* (civil chiefs') claims in favor of family control.<sup>54</sup> Households located dwellings in the middle of their farms in order to lay claim to them.<sup>55</sup> During the initial settlement, the only land safe for farming was located in a small region bounded on the northeast by Osiele, on the Southeast by Oba, and on the North by Aiyetoro.<sup>56</sup> These are shown in Figure 3. In 1846, farms were still confined to the immediate neighborhood of Abeokuta.<sup>57</sup>

"Behind the movements of the Egba armies," Mabogunje (1959, p. 72) argues, "followed their farmers." By 1861, farms extended twenty or thirty miles from the town walls.<sup>58</sup> By 1878 they had stretched out towards Otta and occupied the territory between Owode and Mokoloki.<sup>59</sup> Much land in the South was still uncultivated in 1877, and expansion to the Northeast was impossible before 1893.<sup>60</sup> After this date, many of the *oriles* (the ruined sites of the original townships) were reoccupied. The first re-settlers reported to the township chiefs and were made responsible for dividing land among later settlers.<sup>61</sup>

Mabogunje's argument is one in which the initial scramble for land created strategies of village establishment that disrupted *ogboni* (civil chiefs') control of land, but later reaffirmed it during the reoccupation of the *oriles* (deserted villages). An alternative interpretation would view the Egba case as a Boserupian response to an exogenous shock to population density. In the model, this is a shift from  $\mathcal{S}^E$  to  $\mathcal{S}^S$ . Johnson (1921, p. 17) describes the original home of the Egba as having an area of more than 1,000 square miles,<sup>62</sup> while the area of initial settlement described by Mabogunje

<sup>52</sup>Interview: J. A. Adediran, 9 Aug, 2007.

<sup>53</sup>Blair (1937), p. 32.

<sup>54</sup>Mabogunje (1961), p. 266.

<sup>55</sup>Mabogunje (1958), p. 24.

<sup>56</sup>Mabogunje (1961), p. 260.

<sup>57</sup>Oroge (1971), p. 186.

<sup>58</sup>Oroge (1971), p. 189.

<sup>59</sup>Agiri (1974), p. 469.

<sup>60</sup>Mabogunje (1959), p. 74.

<sup>61</sup>Mabogunje (1958), p. 48-49.

<sup>62</sup>Specifically, he describes it as a parallelogram with its points at Ijaye, Olokemeji, Ibadan, and the coast.



(1961) is only about 160 square miles in area.<sup>63</sup> Observers put the population of Abeokuta in mid-century between 60,000 and 150,000.<sup>64</sup> This gives a range of reasonable density estimates ranging from 375 to 938 per square mile. Even accounting for the upward bias that results from using the population after twenty years of growth and in-migration, the ratio of men to land from 1830 to 1860 was much higher than at the end of the century.

In addition to Mabogunje's sources, there is evidence that Egba farmers expanded outwards as the risks due to war diminished. In 1863, the Governor of Lagos reported that "the natives of the villages dare not cultivate far from their homes lest they should be kidnapped whilst labouring on their farms, and their only protection is the impenetrable bush, which has now overrun again immense tracts of land which but three years ago were covered with fine farms."<sup>65</sup> In 1893, fear of Dahomey raids was still keeping the country west of Abeokuta clear of settlement.<sup>66</sup> In 1893, however, Halligey (1893, p. 31-32, 36) commented that the land between Abeokuta and Otta had, "within the last few years, ... been largely cleared of its forest and thick brush in order to be put in cultivation."<sup>67</sup>

Evidence that the period of land scarcity altered Egba farming practices comes from Cyril Punch's 1902 tour of the Egba country, depicted in Figure 4.<sup>68</sup> Three differences were still apparent between the land-scarce region of initial settlement and those areas occupied later. First, farmers near Abeokuta shortened their periods of fallow. Between Abeokuta and Aberu Agba, Punch reported fallow lengths of 3-4 years, 5-6 years, and 4 years. Between Ijeun and Ashero (northeast of Mokoloki), he reported three times that land was left fallow for 5-6 years. Second, Egba cultivators used intercropping more intensively on the exhausted soils nearer Abeokuta. Third, farmers abandoned the long fallows that allowed the land to return to forest. Punch mentions indefinite or very long fallow periods between Kajola (East of Onibode) and Aberu Agba, Ijeun and Asha, Asha and Ilogbo, Coker's farm and Ashero, and between Okenla and Itori. None of these are in the first stretch from Abeokuta to Onibode, and only one is in the directly southern region where the Egba made their first military expansions. He encountered little forest before Ijeun and between Okenla and Itori.<sup>69</sup> Punch himself believed that the Egba were expanding into "a belt adjoining the forest

<sup>63</sup>It is effectively an oval roughly ten miles by twenty.

<sup>64</sup>Barber (1857, p. 19), 80,000 c. 1845; Freeman (1844, p. 227), twice the size of Kumasi in 1842; Bowen (1857, p. 106), 60,000 to 100,000 in 1850; Beecroft estimated the population at 300,000 in 1850, Hockin estimated the population at 70,000 in 1866, Irving estimated it at 100,000 in 1862, and Forbes estimated it at 50,000 in 1848 according to Townsend (1887, p. 106, 154, 160); Campbell (1861, p. 33), more than 100,000 in 1860; Burton (1863, p. 170), 150,000 in 1861 when the soldiers return. Mabogunje (1961, p. 260) gives three examples of missionaries who put their estimates above 100,000 in private correspondence.

<sup>65</sup>CO 147/3, 5 Jan, 1863: Freeman to Newcastle

<sup>66</sup>NAI, CMS Y 2/2/2 Papers on Abeokuta District 1861-1910, Jan 1893: Letter from Oluinide (name not clearly legible).

<sup>67</sup>In 1898, similarly, witnesses told the Commission on Trade that the Egba were returning to land vacated during the wars – "from 5 miles below our crossing of the River Ogun, the whole valley, down to Abeokuta may be taken as cultivated." (CO 147/133, enc in 4 June 1898: Denton to Chamberlain, Thirteenth Day, extract from Mr. Berger's Report on the Abeokuta-Ibadan Reconnaissance Survey).

<sup>68</sup>NAUK, CO 147/162: 20 Oct, 1902: Acting Governor to Chamberlain.

<sup>69</sup>Fairhead and Leach (1996) demonstrate the problems of attributing deforestation to human causes. Still, the pattern of forest clearing here is consistent with what is known about the Egba removal to Abeokuta and subsequent re-expansion. The alternative narrative of forests created by recent human habitation is not plausible in the Egba case.

and this belt is gradually encroaching on the forest and is itself being encroached on by second rate [fallow] land.”

It remains to explain land disputes. The period of land scarcity contributed to this by making the conditions of grants more contentious. In a 1919 suit,<sup>70</sup> the plaintiff Ajayi claimed that the defendant Rolu had encroached on his land when Ajayi’s father Feyijimi died, extracting two acres and claiming that he had lent the land to Feyijimi. The representative of the township chiefs told the court that Rolu’s father had, in fact, granted the land to Feyijimi as forest, but that Feyijimi had been the first to cultivate it. Rolu denied this, claiming that it had been given as already cleared land during the Ikorodu War (c. 1865). His witness told the court that “there was no forest remaining” at that time. What would have otherwise been a temporary grant with few conditions attached, allowing Feyijimi to plant food crops while he cleared new land, was turned by the scarcity of forest into a holding whose ownership was contested more than fifty years later.

Austin (2008a) notes that while land may be abundant in general, specific plots are valuable for their particular characteristics. Bowen (1857, p. 282) noted that Egba farms were often ten to twenty miles distant from the towns; many of the cases unsurprisingly involve encroachment into a neighboring farm. This did not necessarily result from poorly-defined boundaries; in a 1915 case, the defendant planted cocoa underneath that of the plaintiff while the latter’s niece, who had been left in charge, was ill.<sup>71</sup> Similarly, some sites were desirable for the protection that could be offered by the *olorogun* (war chiefs). In a 1907 suit, the son of the late Balogun of Ijemo stated that during a conflagration, the Igbein people had run to his father at Esi Elebo, who granted them land.<sup>72</sup>

The court cases can be used to show that some land was more valuable and worth defending. I estimate regressions of the form:

$$(33) \quad y_i = \beta_0 + \sum_c \beta_c C_i + X_i' \gamma + \epsilon_i$$

Here  $y_i$  denotes an outcome of interest in case  $i$ . The  $X_i$  are other characteristics of the case; dummies for whether it is a recovery case, whether it is a complete record, and the judgment book from which the case is taken.<sup>73</sup> The  $C_i$  are indicators for the crops affixed to the land. Results are given in Table 7. The general pattern that emerges is that land that was more valuable due to the crops on it was more vigilantly defended and more likely to be involved in a commercial transaction. Plots endowed with palm trees were more likely to be pawned, and more likely to have been defended through the use of a caretaker. Plots with either tree crop were more likely to have been discussed before the township chiefs; either disputes were more common over these or parties expended more effort in pursuing their claims over these.

Plots on which cocoa stood were, on average, more than £7 more valuable than other plots. Cocoa was planted on what would otherwise have been the worst land, and so this is likely an underestimate. Once marshy land acquired value, stale claims were reasserted. In a 1909 suit, the plaintiff’s brother had planted kola on the defendant’s land in 1872 without dispute, but the

<sup>70</sup>Ake A Civil Suit 29/1919, re-hearing of Suit 1125 of 1917.

<sup>71</sup>Abeokuta Civil Suit 906/1915.

<sup>72</sup>Ake “A” Civil Suit 725/07.

<sup>73</sup>These are finer than year dummies.

defendant attempted decades later to reclaim it.<sup>74</sup> The inspector reported that “it is now that people are using marshy soil for cocoa plantations that dftd [defendant] came to claim.” Though the plaintiff was evicted, the defendant was ordered to pay compensation for the kola.

5.4. **Labor.** Labor was scarce in Egba territory. The result was that it was uncommon for men to exchange their labor for cash; for the freeborn, it was “opprobrious.”<sup>75</sup> As land was virtually free, individuals could earn more working for themselves than as hired laborers. Even during the slack season, farmers could gather palm fruits or forest produce.<sup>76</sup> Further, the considerable distances between Egba farms raised the costs of supervision. Where wage-labor existed, it was provided by foreign visitors with deep pockets and few dependents. The workers employed in printing the missionary newsletter were paid four to five dollars per month.<sup>77</sup> Even foreigners had trouble acquiring labor. In 1854, the missionary Henry Townsend wrote that, “to keep down the salaries of the native agents of the society is very difficult more especially so as some of them have had a taste of European life in a style far above their means.”<sup>78</sup> During their free days, slaves preferred to cultivate for themselves rather than work for wage labor for the missionaries, and James Johnson could not find anyone to tend a horse for 15s per month in 1877.<sup>79</sup>

This section deals in turn with three of the mechanisms used by the Egba to cope with labor scarcity – slavery, cooperative work groups, and claims over the labor power of kin and dependents.

5.4.1. *Slavery.* The use of slaves was widespread. Christian converts who could be persuaded to give up polygyny often would not abandon their slaves.<sup>80</sup> Townsend wrote in 1846 that “the working part of the population” consisted “chiefly” of slaves, while in the 1870s Johnson wrote that slaves were a “very considerable” proportion of the population.<sup>81</sup> Bowen (1857, p. 320) estimated in mid-century that at least four fifths of the population were “free.”<sup>82</sup> James Davies told the 1898 Commission on Trade that a third of the original inhabitants were slaves, and that women were the most valuable of these.<sup>83</sup>

Slaves were generally strangers,<sup>84</sup> and became slaves as a result of famine, capture, debt, or as punishment for crime.<sup>85</sup> Initially, the Egba raided their southern neighbors for slaves.<sup>86</sup> The increased prominence of the *olorogun* (war chiefs) gave them an advantage in slaveholding; in the model this would be a fall in  $r$ . These chiefs were often able to evade the law prohibiting kidnapping from friendly and subject towns.<sup>87</sup> Both free and slave soldiers were required to turn over some

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<sup>74</sup>Abeokuta Civil Suit 91/1909.

<sup>75</sup>Agiri (1974), p. 467.

<sup>76</sup>Clarke (1871), p. 262.

<sup>77</sup>Burton (1863), p. 76.

<sup>78</sup>CMS CA2/O85 #23: Aug 5, 1854: Townsend to Straith.

<sup>79</sup>Oroge (1971), p. 244-245.

<sup>80</sup>Oroge (1971), p. 222.

<sup>81</sup>Oroge (1971), p. 166.

<sup>82</sup>Burton (1863, p. 299) made the same estimate.

<sup>83</sup>NAUK, CO 147/133, enc in 4 June, 1898: Denton to Chamberlain. Evidence for 18th day.

<sup>84</sup>Interview: Chief F. Anidugbe, 27 July, 2007.

<sup>85</sup>Burton (1863), p. 301.

<sup>86</sup>Agiri (1981), p. 133.

<sup>87</sup>Oroge (1971), p. 127.

or all of their captives to their commanders.<sup>88</sup> James Davies stated that, during the early 1880s, the most prominent men in Abeokuta had up to 400 slaves and treated them better than their own children.<sup>89</sup> The *olorogun* (war chiefs) also used their soldier-slaves to collect tolls, to provide armed escorts for travelers, as blacksmiths, and as horse-minders.<sup>90</sup> Some kept their slaves out of the Ijaiye and Aibo wars in order to keep them on their farms, which Oroge (1971, p. 165-166) has called “the economic nerve-centres of Yorubaland.”

Over time, slaves were increasingly purchased in markets to the North, in Rabba and Ilorin. By 1870, James Johnson reported that “Hausa” slaves were predominant in Abeokuta.<sup>91</sup> These northerners were far from home and less likely to flee. Bowen (1857, p. 320) put the price of a slave at thirty to sixty dollars, depending on age and quality.<sup>92</sup> In an 1852 letter, Townsend described the plight of a slave communicant, whose redemption price of sixty dollars was “very far beyond a poor man’s means.”<sup>93</sup>

Slaves were used as soldiers, and even commanded armies.<sup>94</sup> They were used for sacrifice.<sup>95</sup> Most, however, were employed in trade and agriculture. Male and female slaves were used as porters and canoe pullers, and female slaves were used in palm oil production.<sup>96</sup> In 1872, the Alake (the most powerful of the four Egba kings) and other Egba officials wrote to the Governor of Lagos that slaves were used “in the same way as children of our body begotten, they are to help us in working our farms to obtain the produce needed in the European market, this is the only investment we have here.”<sup>97</sup> James Johnson in 1880 similarly noted that slaves were considered a better investment than cloths and beads.<sup>98</sup>

In the model, increasing *A* makes slavery more attractive; the export market for palm produce functioned in the same way. Burton (1863, p. 301) wrote that “the development of commerce naturally increases the necessity for slave labour in a land where hired labour is expensive and uncertain.” When James Johnson attempted in 1879 to enforce the CMS policy of forbidding its members from holding slaves, he was confronted by a group of converts who were also prominent

<sup>88</sup>Agiri (1981), p. 133.

<sup>89</sup>NAUK, CO 147/133, enc in 4 June, 1898: Denton to Chamberlain. Evidence for 18th day. Agiri (1974, p. 468) gives a similar estimate from 1880 that some chiefs had more than 100, and up to 400 slaves.

<sup>90</sup>Oroge (1971), p. 102-105, 130-131.

<sup>91</sup>Agiri (1981), p. 137.

<sup>92</sup>Other price estimates include: Barber (1857, p. 118), £6/10 or 30 heads of cowries for a woman in 1857; Burton (1863, p. 323), 8 to 10 bags cowries in 1861, 12-16 for slaves preferred for export – at 18s per bag, this was equivalent to £9 or 40 dollars, and; Alake and other officials 35-40 bags in 1872 (CO 147/23 enc in June 15, 1872: Pope Hennessey to Kimberly, op. cit.), £16 for a runaway slave in 1862 (Oroge (1975, p. 69)).

<sup>93</sup>CMS CA2/O85 #13: July 29, 1852: Townsend to Venn.

<sup>94</sup>Losi (1924), p. 71.

<sup>95</sup>While Barber (1857, p. 129) describes the situation of a female convert whose Ijebu mistress wished to use her for a sacrifice for reasons not given, Stone (1900, p. 245) was direct witness to the sacrifice by “the chiefs and Ogbonee elders” of a slave purchased in the market. This was done in order to gain Ogun’s favor during the Ijaiye war. Oroge (1971, p. 141), defending “domestic” slavery as opposed to the slave trade, argues that slaves used for sacrifice were invariably purchased from markets, and that no master would sacrifice his own slave.

<sup>96</sup>McIntosh (2009), p. 130.

<sup>97</sup>NAUK, CO 147/23 enc in June 15, 1872: Pope Hennessey to Kimberly.

<sup>98</sup>Oroge (1971), p. 179.

traders – Mary Coker, Lydia Yemowi, Susanah Lawolu, and Blesy Desola<sup>99</sup> – and by “sword-wielding agents of the Egba authorities.”<sup>100</sup> These women demanded roughly £2/10 per year from their trader-slaves, who could keep the surplus above this, while non-Christian owners were said to have charged less.<sup>101</sup>

Europeans believed that, without the institution of slavery, there would be an acute shortage of labor. A faction of missionaries led by Samuel Crowther argued for the continuation of domestic slavery. While this was in part motivated by an “appreciation of the complex nature of the institution,” their self-interest in obtaining labor also played a role.<sup>102</sup> As Townsend wrote in 1856, “we are ourselves not in a position to refuse slave labor. A case in point, a servant hired by Mr Clegg is a slave and a part of the hire goes to his master.”<sup>103</sup> No pressure was brought on the Christian converts to liberate their slaves after 1881, and in 1887 Reverend Wood cautioned against taking actions to abolish slavery.<sup>104</sup>

When British intervention in the Yoruba interior became more direct after 1893, expatriate merchants feared that widespread slave desertions had hurt trade. Rufus Alexander Wright told the Commission on Trade that in Abeokuta and Ijebu “the slaves have felt safe in running away. I don’t think there will ever be a return to the old system.”<sup>105</sup> One observer wrote in 1893 that “the money value of slaves [was] decreasing, and they [were] showing increased freedom in word and act” because their chances of escaping to British territory had increased.<sup>106</sup> The issue of labor scarcity was not short-lived; in 1904 MacGregor reported the complaints of Aina, a “leading farmer,” who argued that there was a “dearth of labor since the cessation of slavery, and [that] paid labour was now both costly and difficult to obtain.”<sup>107</sup>

Because of these fears of labor scarcity, both the British and the EUG tacitly endorsed slavery. Governor McCallum wrote in an 1897 dispatch that he was prepared to write to the ‘native states’ that “as regards domestic slaves the status quo must be maintained and runaways must in all cases be given up by the governing powers unless funds are forthcoming to pay for the necessary compensation.”<sup>108</sup> The colonial office was sympathetic to his view that there should be no direct interference with slavery, but forbade him to assist in recovery of fugitive slaves.<sup>109</sup>

In 1901, the EUG prohibited slave-dealing, though not slave-holding, providing that no person should be “dealt or traded in, purchased, sold, bartered, transferred or become a slave.”<sup>110</sup> At the same time, the EUG declared that a slave could redeem himself for £5 and that an ill-treated slave could claim freedom.<sup>111</sup> The Railway Commissioner acted in concert with the Egba authorities

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<sup>99</sup>Agiri (1981), p. 140.

<sup>100</sup>Oroge (1975), p. 79.

<sup>101</sup>Oroge (1971), p. 209.

<sup>102</sup>Agiri (1981), p. 139.

<sup>103</sup>CMS CA2/O85 #32: Dec 1, 1856: Townsend to Venn.

<sup>104</sup>Oroge (1971), p. 281.

<sup>105</sup>NAUK, CO 147/133, enc in 4 June, 1898: Denton to Chamberlain.

<sup>106</sup>NAI, CMS/Y/2/2/2, Papers on Abeokuta District, Jan 1893 letter from Oluminde.

<sup>107</sup>NAUK, CO 147/169 30 Jan, 1904: MacGregor to Lyttelton.

<sup>108</sup>NAUK, CO 147/121, 20 June, 1897: McCallum to Chamberlain.

<sup>109</sup>Oroge (1971), p. 387.

<sup>110</sup>NAI, Abe Prof 8/3, Report Book on Egba Affairs.

<sup>111</sup>Oroge (1971), p. 403.

to help liberate slaves brought into Egba territory or whose masters were preparing to sell them, but made no moves against slave-holding.<sup>112</sup> Several examples of requests for manumission are in evidence in the Mixed Court Civil Record Book (1907-09), in which payments of £5/10 or £10/10 are made. Certificates of freedom were issued by the court as late as 1922.<sup>113</sup> Actively abolitionist efforts, then, were limited to slave trading and exceptional cruelty.

5.4.2. *Cooperative work groups.* Austin (2008a, p. 597-598) argues that the scarcity of labor in Africa is tempered by the seasonality of labor demand. Bowen (1857, p. 285) noted that during the dry season, it was possible to “hire any number of people to labor for reduced wages.” A variety of industries existed to raise the productivity of labor in the off-season, including what Burton (1863, p. 160) called the “five great crafts” – blacksmith, carpenter, weaver, dyer and potter. For the typical Egba farmer, however, peak labor demand occurred when manpower was least available. While a client could ask his chief to send men to help him clear his farm,<sup>114</sup> two types of cooperative work group – the *owe* and *aro* – were the most common solutions.

The *owe* was an informal arrangement, whereby a man’s sons-in-law, other relatives or neighbors could be commissioned to aid in clearing a land or forest, or in building a house.<sup>115</sup> The *aro*, by contrast, was a contract between members of the same age-grade to take turns in assisting each other in clearing, sowing, and harvesting.<sup>116</sup> In both cases, the beneficiary “feasted his benefactors very lavishly” and was obligated to offer his own labor in return.<sup>117</sup> That these were sustained through repeated interaction suggests that they were needed to overcome the moral hazard problems that hindered the use of wage labor. This was strengthened in the case of the *aro* by its semi-religious nature.<sup>118</sup>

5.4.3. *Wives, kin, and dependents.* Egba farmers coped with the shortage of labor by asserting claims on the labor of other members of their households, by attracting dependants, and by taking wives. Egba wives retained some economic independence, notably in trade and craft work; Stone (1900, p. 23-24) wrote that:

women are even more industrious than the men. They have to support themselves and their children and they most diligently follow the pursuits which custom has allotted to them. They spin, weave, trade, cook, and dye cotton fabrics. They also make soap, dyes, palm-oil, nut-oil, all the native earthenware and many other things used in the country.

Despite this independence, marriage transferred current payments of cash and labor for future claims on the productive and reproductive labor of the wife. Marriages were usually arranged.<sup>119</sup> Families manipulated bridewealth to raise money for economic and social projects, and to pay

<sup>112</sup>Oroge (1971), p. 404.

<sup>113</sup>NAI, CSO 26 11799, Question of Slavery in British West Africa, 30 Sept 1924: District Officer, Egba to Resident, Abeokuta. In this dispatch, the District Officer provides a list of fourteen cases from the years 1918-1922.

<sup>114</sup>Oroge (1971), p. 151.

<sup>115</sup>Fadipe (1970), p. 256.

<sup>116</sup>Agiri (1974), p. 467.

<sup>117</sup>Agiri (1974), p. 467.

<sup>118</sup>Oroge (1971), p. 154.

<sup>119</sup>McIntosh (2009), p. 84.

off debt.<sup>120</sup> A woman's relatives might use coercion and even violence to pressure her to become married, and to stay married.<sup>121</sup> The wife's family was owed a variety of obligations including work, regular contributions of harvest crops, and assistance with expenses such as funerals until the girl reached puberty.<sup>122</sup> A second cash payment, which Partridge (1911, p. 425) put between £2/10 and £10 depending on the wealth of the bride's parents, was then due.<sup>123</sup>

Payment of bride-price established claims on the children, and the repayment of bride-price due on divorce lessened with the birth of children.<sup>124</sup> Gollmer (1889, p. 119) described bride-price (which he guessed at £2 to £5) as a sort of pledge used to chastise a wife – “have I not paid so much on your head?” or “if you pay the forty or fifty heads of cowries I paid on your head, you can go home again.” In divorce cases, it was common for men to receive custody of the children, under the traditional belief that children “belonged” to their father.<sup>125</sup> In a 1919 suit,<sup>126</sup> the plaintiff sued because his wife had been “seduced” by another man who had refunded the £5/10 bride-price, but did not return his two children.

In a 1919 suit,<sup>127</sup> the plaintiff Amodu sued the defendant Aridegbe for a £12/10 loan that had been raised by Aridegbe's husband Ewetade on which Aridegbe had been the pawn and Amodu had been the surety. Ewetade had borrowed £10/10 to pay the bride-price owed to Aridegbe's previous husband. Amodu had taken Ewetade to his village, but Ewetade then fell ill. After “much begging,” Aridegbe told the court that she had agreed to serve in his place for five months. After a year, she “got tired of it and left to have another husband,” who had since returned the dowry owed to Ewetade through the Itoko chiefs. She had a child for her previous husband, and had left the child with Ewetade. Amodu and Ewetade together pawned the child, when her previous husband intervened and sued successfully for custody. Despite the fact that Aridegbe was able to leave her husband when a better opportunity arose, according to her own account her labor and reproductive powers were manipulated by men.

Junior wives were expected to work for senior wives, and all wives were obligated to help their husbands' other male relatives.<sup>128</sup> Women did the bulk of “domestic” labor – cooking, cleaning and caring for younger children.<sup>129</sup> Since a man's obligations were to his parents and siblings, wives were responsible for their children's resources.<sup>130</sup> Women did not traditionally take part in clearing,

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<sup>120</sup>Byfield (1996), p. 34.

<sup>121</sup>Byfield (1996), p. 42-43.

<sup>122</sup>Hopkins (1969), p. 80.

<sup>123</sup>Folarin (1939, p. 18-20) divides the payments before marriage as follows: first, *Baba gbo* or *Iya gbo*, 22s and two bottles gin; second, *Ijohun*, £3; third, *Idana*, £5/10 to £10/10, *Ipalemo*, £2/10 or more, and; fourth, *Idamolidi Ifa*, £2 to £2/10. Together, these constituted *Owo Ife*, though in some cases a lump sum of “£10 to £15 or more” could be paid.

<sup>124</sup>Lloyd (1968), p. 70.

<sup>125</sup>McIntosh (2009), p. 103.

<sup>126</sup>Header information is missing; plaintiff's statement recorded on p. 436 of Ake “A” Civil Judgment Book Vol. 27, 1918-1919.

<sup>127</sup>Ake “A” Civil Suit 177/1919

<sup>128</sup>McIntosh (2009), p. 81, 88.

<sup>129</sup>McIntosh (2009), p. 111.

<sup>130</sup>McIntosh (2009), p. 112.

planting,<sup>131</sup> or sowing, but did prepare food on the farm for men and assisted in the harvest.<sup>132</sup> Processing crops was women's work. Campbell (1861, p. 51-52) described the arduous process of turning palm fruits into oil and kernels. In return for their labor, women would retain the palm kernels, while the revenue they earned selling oil was the property of their husbands.<sup>133</sup>

Marriage was polygynous. Stone (1900, p. 99-100) reported that a "man's position and importance here are estimated by the number of his wives and the men seem willing to make almost any sacrifice for a little fictitious notoriety." Partridge (1911, p. 427) estimated that in the past a "man in good position" would have as many as two hundred wives, though when he wrote thirty was the most that a man might have. The important chiefs, impoverished by their loss of position and "supply of free labor," rarely had more than ten. Byfield (2002, p. 65) argues that the cocoa boom at the turn of the century increased the demand for labor, creating a "rush to get wives."

The marriages of slave wives, pawned girls, and kinless women were different.<sup>134</sup> Folarin (1939, p. 9) reported that if a pawnee wished to marry a female pawn, the "proper course" was to pay bride-price to her family; if she were "defiled" by him, the pawn money would be forfeited. A 1910 report argued that it had been common to purchase slaves as wives during the Yoruba wars.<sup>135</sup> While Folarin (1939, p. 13) suggests that a female slave who married her master thereby freed herself and her children, McIntosh (2009, p. 85, 114-115) provides examples of Egba women who did not become free or receive any better treatment. Two wives of the *Jaguna* Ogunbiyi fled to Lagos in 1869, seeking asylum.<sup>136</sup> In a 1918 case, the defendant claimed a piece of land through his grandmother, a slave wife of the plaintiff's patriarch Afonja.<sup>137</sup> She had been redeemed by her family while pregnant, demonstrating that her productive and reproductive capacities were valuable to both her husband's lineage and her own kin.

Dependants were desirable before 1893 for both their labor services and the security they provided. Fadipe (1970, p. 147) writes that each man "had the help of the dependent male members of his family in tilling the field, planting crops, as well as reaping." The EUG Secretary testified to the WALC that "you would almost beg people to come live with you."<sup>138</sup> Immigrants, he argued, were needed to protect settlements from outside raids, and so they could acquire land for a "return payment, however small."<sup>139</sup> Accumulation of dependents did not end with the Yoruba wars. In a 1915 suit, the defendant Abogurin had been brought to the plaintiff Akide around 1904 by a mutual acquaintance, and asked for land.<sup>140</sup> Akide told the court that "I agreed as I want good people about me," and made similar grants to nine other individuals. A "stranger" of this sort lived under the protection of the family head; "it [was] his duty to rejoice with them in their happiness

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<sup>131</sup>McIntosh (2009, p. 120) writes, conversely, that they did help with extra labor in planting.

<sup>132</sup>Hopkins (1969), p. 82.

<sup>133</sup>Fadipe (1970), p. 151.

<sup>134</sup>McIntosh (2009), p. 85.

<sup>135</sup>Hopkins (1969), p. 82.

<sup>136</sup>Oroge (1975), p. 78.

<sup>137</sup>Ake "A" Civil Suit 419/1918.

<sup>138</sup>WALC (1916b), p. 453.

<sup>139</sup>WALC (1916a), p. 187.

<sup>140</sup>Abeokuta Civil Suit 905/1915



and sympathize with them in their sorrow.”<sup>141</sup> He was expected to offer “voluntary” service in the form of two or three days of labour annually.<sup>142</sup> He was also to give presents at annual festivals and make contributions towards family funeral expenses.<sup>143</sup>

Elders and the *olorogun* (war chiefs) had an advantage in attracting – or compelling – dependents, which explains why Townsend noted that it was the chiefs who were “turning to agriculture” by experimenting with crops such as cotton. One, he noted, “farms a large piece of ground and is reputed to be sufficiently well off.”<sup>144</sup> Ogundipe, the plaintiff’s witness in a 1919 suit,<sup>145</sup> told the court that their uncle Kute, “being older than us all he insisted that pltf [plaintiff] was to come + live in his village.” Burton (1863, p. 144) described Okukenu as “rich in land and slaves.” In a 1917 case, the defendant Alaji of Ikeredu claimed that his father was a slave who redeemed himself but chose to remain with his master until his master attempted to sell him to pay off his debts; he approached the Balogun of Ikereku, who gave him a site on which to build a house.<sup>146</sup>

A variety of institutions existed, then, enabling the Egba to cope with chronic labor scarcity, and so the supply and demand for labor were resolved through competition for rights over persons. While those with only their labor power to offer were compelled to rely on reciprocal work arrangements, individuals with economic and social capital or means of coercion could access the labor power of slaves, pawns, wives, sons, kin, and dependents.

**5.5. Capital.** The inability to use land as collateral made borrowing difficult, and this section describes the credit institutions that did exist. Most important of these was the system of *iwofa*, or human pawning. Next, this section discusses the difficulties Europeans faced advancing credit to the Egba. Finally, it outlines impact of the introduction of kola and cocoa on the credit market.

**5.5.1. Credit without collateral.** A variety of institutions for borrowing existed other than human pawning, though generally these were so unpleasant that the missionary Samuel Crowther in comparison called pawning “a custom of relief.”<sup>147</sup> Barber (1857, p. 109) states that farmers’ rotating credit societies prevented idleness, facilitated saving, and served as a form of insurance, but does not suggest that they assisted the Egba to raise capital. Some 300 of these *esusu* clubs operated in Abeokuta in 1861.<sup>148</sup> Interest rates on cash loans were very high. Folarin (1939, p. 58) describes an hypothetical loan of 20,000 cowries, on which 200 cowries would be charged as interest every market day, totalling 40,000 over the course of a year.<sup>149</sup> Barber (1857, p. 116) describes one communicant who owed roughly 16s 8d to a creditor, onto which 5d interest was added every 9 days; this would total 62% over the course of the year. A colonial official during the 1920s noted that the rich at Owode had invested in receiving farms on pawn, and received 30-60% interest, with 100% paid in

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<sup>141</sup>Folarin (1939), p. 69.

<sup>142</sup>Hopkins (1969), p. 85.

<sup>143</sup>WALC (1916a), p. 187.

<sup>144</sup>CMS, CA2/O85 #11.

<sup>145</sup>Ake “A” Civil Suit 119/1919.

<sup>146</sup>Ake “A” Civil Suit 163/1917.

<sup>147</sup>Oroge (2003), p. 337.

<sup>148</sup>McIntosh (2009), p. 133.

<sup>149</sup>He also gives the example of a loan of 12/6 with 5/6 interest charged after 7 months.

the case of palms.<sup>150</sup> In 1924, another official elsewhere in Yoruba territory cited interest rates of 30-60% as typical.<sup>151</sup>

The methods of collecting debt made these loans particularly unattractive. These were resorted to because land had no value as collateral, and there were few substitutes available. Traders could be seized for the debts of a countryman and sold into slavery.<sup>152</sup> Folarin (1939, p. 60-61) lists four methods of recovery – *ogo*, *edan*, *emu*, and sale into slavery.<sup>153</sup> If *ogo* was used, a messenger, possibly a leper, was sent to the debtor's house. He could eat his food, wear his clothes, and "do all in his power to worry or irritate him." If the *edan*, a ceremonial staff was sent by the township authorities to the house of the borrower and payment was not immediately forthcoming, the goods or persons in the house could be sold. *Emu* enabled a creditor of long standing to recover his debts by seizing persons or property of the debtor, who was fined for causing the authorities to become involved. The debtor himself could be sold into slavery on application by to the *ogboni* (civil chiefs).

5.5.2. *Human pawning. Iwofa* (pawns) were those whose labor had been pledged for a debt. Labor by the pawn was taken in lieu of interest until the principal was repaid. Pawnship first appears in Egba oral histories in the settlement of Abeokuta, during which Egba pawned themselves to Itoko and Ibara farmers to escape famine.<sup>154</sup> In 1936, the Egba District Officer estimated that there were five thousand *iwofa* in the division.<sup>155</sup> Richer men could acquire more pawns; one informant claimed that his father had 60 working in his farms.<sup>156</sup>

Describing *iwofa* amongst the Yoruba in general, the Senior Resident at Oyo wrote in 1924 that the most common pawning contract was for a debt of £2/10 to £7/10. Critically, he noted that "no one will lend money to a man under the above system unless the borrower is vouched for and can find a surety who is responsible for the repayment of the loan."<sup>157</sup> The importance of the guarantor, or *onigbowo*, is stressed by the proverb that "the *iwofa* suffers no inconvenience, it is the guarantor who is inconvenienced."<sup>158</sup> The *onigbowo* was paid a fee of 6d, but became responsible for repayment of the debt if the pawn died or absconded.<sup>159</sup> The working of the *iwofa* system depended, then, on a third party able to monitor and discipline the pawn.

Although colonial officials viewed *iwofa* as a voluntary act for adult men, with pawning of children as an unacceptable form of disguised slavery,<sup>160</sup> the Egba saw it primarily as one involving children and dependents. The Alake volunteered the example of a son who pawned himself to save the family head from the disgrace of being a debtor.<sup>161</sup> Folarin (1939, p. 8-9) stressed that "[a]ny

<sup>150</sup>NAI, CSO 26 24873 Assessment Report Owode District

<sup>151</sup>NAI, CSO 26 06827 Vol II "Pawning of Children," 17 Oct, 1924: Resident Oyo to Secretary, Southern Provinces.

<sup>152</sup>Townsend (1845), p. 3.

<sup>153</sup>These are also discussed in Hopkins (1969, p. 91-92)

<sup>154</sup>Ajisafe (1924), p. 64.

<sup>155</sup>NAI, Abe Prof 2 EDC 30 Iwofa: 12 Nov, 1936: District Officer Egba to Resident

<sup>156</sup>Interview: Chief J. Adeleye, 2 Sept, 2007.

<sup>157</sup>NAI, CSO 26 06827 Vol II "Pawning of Children" 17 Oct, 1924: Resident Oyo to Secretary, Southern Provinces.

<sup>158</sup>Fadipe (1970), p. 191.

<sup>159</sup>Fadipe (1970), p. 191.

<sup>160</sup>Byfield (2003), p. 365.

<sup>161</sup>NAI, CSO 26/1 03063: Enactment of the Slavery Ordinance (1916); Nov 5, 1915: Secretary Egba Native Authority to Commissioner.

person male or female may be pawned, whatever his age, by his parents or relations.” One of my informants suggested that:

since am polygamist I was then free to take two of my children one from each wives and then go to the money lender that I needed money and so take these children of mine let them be with you to assist you with your work while you borrow me money I will come for them in two or three season time since I did not sell the children to him and by the that time I will also bring the money.<sup>162</sup>

An *iwofa* would serve the creditor “in any capacity agreed upon.”<sup>163</sup> A pawn’s family could negotiate with the creditor about how their relative was treated.<sup>164</sup> Pawns were given a daily assignment to complete, while slaves were used “to any extent.”<sup>165</sup> They could refuse transport work.<sup>166</sup> An *iwofa* might work half-days, from 6AM until noon for the *olowo* (creditor),<sup>167</sup> two or three days during the week,<sup>168</sup> nine days out of every eighteen,<sup>169</sup> one hundred heaps in a four day week,<sup>170</sup> or one week in three.<sup>171</sup>

The institution of *iwofa*, then, provided a resolution to both labor and capital scarcity where alternative forms of collateral were unavailable. Oroge (2003) argues that the most common reasons that individuals were pawned in Yoruba society were sieges during war, for the welfare of poor children (as the *olowo* was obligated to care for a child pawn), and the heavy expenses incurred in religious obligations, funerals, marriages and court fines – i.e., for consumption loans. Creditors preferred to receive the labor services of pawns over holding other assets on pawn. There are a handful of cases in the court records in which palms were made part of a debt contract only after an *iwofa* arrangement had broken down.<sup>172</sup> In a 1915 suit, the plaintiff’s brother had pawned himself to the defendant for £5.<sup>173</sup> The defendant claimed that, as no *onigbowo* could be found, he took over the farm and palms as surety when the *iwofa* refused to serve him. Although he received repayment of the principal, he told the court that “the nuts I reaped I took as my interest.”

5.5.3. *European credit.* Egba contact with European merchants did little to ameliorate these conditions. Europeans were reticent to lend because of the risks involved. As early as 1863, Europeans in Lagos complained that Africans could escape to Abeokuta, becoming “refugees for debt.”<sup>174</sup> In 1912, John Deemin wrote to Ayles, another merchant, that he had advanced £3475 at Abeokuta,

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<sup>162</sup>Interview: Chief T. Ojewumi.

<sup>163</sup>Folarin (1939), p. 8.

<sup>164</sup>Interview: R. A. Popoola, Sept 2, 2007

<sup>165</sup>Interview: I. A. Amosu, 27 July, 2007

<sup>166</sup>NAUK, CO 147/162: 20 Oct, 1902: Acting Governor to Chamberlain

<sup>167</sup>NAI, CSO 26/1 03063: Enactment of the Slavery Ordinance (1916): Short Memorandum on the Egba Native Custom of Ofa (by A. Edun Oct 14, 1915).

<sup>168</sup>Barber (1857), p. xvii.

<sup>169</sup>Folarin (1939), p. 9.

<sup>170</sup>Byfield (2003), p. 361.

<sup>171</sup>Johnson (1921), p. 127.

<sup>172</sup>See Abeokuta Civil Suit 631/1915 and Abeokuta Civil Suit 854/1915, or Ake “A” Civil Suit 196/1919 for additional examples.

<sup>173</sup>Abeokuta Civil Suit 538/1915.

<sup>174</sup>NAUK, CO 147/4, 6 Nov, 1863: Glover to Newcastle.

and after accusing his correspondent of giving loans to risky borrowers, stated that it was “easy enough to give out credit, but a very difficult matter to get it paid.”<sup>175</sup>

Together with Egba commercial interests, the European firms in Abeokuta and Lagos led an unsuccessful campaign to make urban land attachable for trading debts. Here, the obstacle was the combined policy of the colonial government and the EUG that foreigners were not to acquire any permanent interests in land.<sup>176</sup> A 1903 circular stipulated that lands and houses in Abeokuta could not be sold or mortgaged to anyone not a native of Egbaland.<sup>177</sup> This prohibition may have been in force earlier; in a 1902 suit G.B. Ollivant & Co. attempted to attach Isaac Coker’s houses and lands at Itesi for a debt; the court disallowed this, permitting them to send tappers to work Coker’s rubber, but noting that “lands and houses are forbidden to be sold in all the Egba United Government territories.”<sup>178</sup>

The outcome of this inability to provide collateral on loans was perverse; by the early 1920s, demolition of houses for sale as scrap had become widespread. Folarin (1931, p. 81) wrote in 1930 that “several houses in the town have been demolished and the town bore every appearance of warlike devastation and desolation.” In 1922, a petition signed by *ogboni* (civil chiefs), *olorogun* (war chiefs), *parakoyi* (trade chiefs), Christians, and Muslims was sent to the Alake and Council asking for the ability to attach land for debt.<sup>179</sup> The document carried 800 signatures.<sup>180</sup> The council was aware that the destruction of houses was “not good” and that the restrictions raised interest rates, but still chose to take no action.<sup>181</sup>

5.5.4. *Tree crops.* When palms, cocoa, or kola were pawned, no interest was charged and use of the trees was turned over to the creditor until the loan was repaid. In the sample of court records it is difficult to identify the specific terms on which palms were pawned. The number of trees given over is only reported once – in a 1917 suit, the plaintiff claimed she had pawned twelve trees for one shilling each.<sup>182</sup> Still, seventeen clear examples of pawning of land with palm trees, without any other tree crops mentioned, and in which the amount received is stated yield an average loan of a little over £6/10.<sup>183</sup>

<sup>175</sup>RHL, Mss Afr s 1657 John Deemin Papers, Deemin to Ayles, 17 Jan 1908

<sup>176</sup>For an analysis of the reasons for this policy, which appeared in various forms throughout West Africa, see Phillips (1989).

<sup>177</sup>NAUK, CO 147/166, enc in 9 June, 1903: MacGregor to Chamberlain.

<sup>178</sup>NAA, ECR 2/1/3 Civil and Criminal Record Book No. III 1902-03, Suit 337: G.B. Ollivant & Co. v. Isaac O. Coker

<sup>179</sup>Folarin (1931), p. 115-118.

<sup>180</sup>NAA, ECR 1/1/19 Egba Council Records Vol 1.

<sup>181</sup>NAA, ECR 1/1/19 Egba Council Records Vol 1.

<sup>182</sup>Ake “A” Civil Suit 719/1917.

<sup>183</sup>Abeokuta Civil Suit 693/1908, pawned for 40 bags of cowries or £10 to pay medical expenses; Abeokuta Civil Suit 551/1915, pawned at Ilawo for £2/10 some time between 1875 and 1890 while the owner was away; Abeokuta Civil Suit 556/1915 pawned more than seven years prior to the case for £2/10; Abeokuta Civil Suit 561/1915, pawned at Igbo-Oya in 1897 for £10; Abeokuta Civil Suit 631/1915, pawned for £12/10 c. 1914 at Oluwo; Ake Central Suit 548/1905, pawned for £5, Abeokuta Civil Suit 70/1911, pawned less than ten years ago for £2/10 by a man with no right to pawn it, Ake “A” Civil Suit 299/1917, pawned ten years prior for £5; Ake “A” Civil Suit 352/1917, pawned six years earlier for £6 for after plaintiff’s mother died; Ake “A” Civil Suit 590/1917, pawned 12 years earlier for £7/10; Ake “A” Civil Suit 124/1918, pawned for £3/10 a year before at Asaya; Ake “A” Civil Suit 792/1917, pawned for £1/5 17 years and six months before at Olope; Ake “A” Civil Suit 225/1918, pawned at Awowo four years earlier for £7/10; Ake “A” Civil Suit 31/1918, pawned at Agbadu in 1918 for £2/15 to pay damages in a trespass suit; Ake

Pawning palms to raise capital was, however, problematic. The estimate cited above that the interest on palm trees at Owode was much higher than that on other loans suggests a substantial risk premium. Further, the estimated profit of 26s on 24 bearing trees was similar to the rate of 1s per tree in a pawning contract, which encouraged borrowers to redeem their loans as quickly as possible.<sup>184</sup> Early repayment created risk; in a 1905 suit, the defendant refused to accept sixteen bags of cowries as redemption because he had not had time to do more than clear the land in the two years it had been in his possession.<sup>185</sup> The fundamental difficulty, however, was that palms were not scarce.

Cocoa and kola presented fewer difficulties, though much of the evidence that they were used to raise capital comes from the period after 1914. Ward-Price (1939, p. 92) argued that the pawning of cocoa farms was common. In neighboring Ibadan, Captain Ross reported in 1926 that a loan of £7 could be raised on 100 good cocoa trees – roughly 1/5 per tree.<sup>186</sup> At Owode during the 1920s, trees were typically pawned for 2/6 apiece.<sup>187</sup> Seven cases in the records exist in which land with cocoa and without palms being mentioned was pawned and the amount stated in court; the average sum in these transactions is a little over £5/15.<sup>188</sup> Each interviewee agreed that individuals could use their cocoa farms as a source of credit. Investment of labor in the creation of a cocoa farm established what Besley (1995) has called “Lockean” claims to ownership.<sup>189</sup> This reduced some of the uncertainties involved. Further, as a scarce asset with a higher annual yield, cocoa was simply more valuable than palm trees. Finally, cocoa farms could also be sold.

## 6. CONCLUSION

Bad institutions are one of the fundamental causes of African poverty, and the institutions that exist on the continent currently have been shaped by those that existed prior to colonial rule. I have addressed a theme in the economics literature – how geography affects institutions – by looking in depth at one hypothesis from the literature on African history. I find that African land tenure, slavery, polygyny, credit markets, and states have all been decisively shaped by the continent’s abundance of land and scarcity of labor. I find that this perspective explains much about institutions in pre-colonial Africa, using both cross-sectional evidence on institutions and detailed study of a single society. The use of a formal model and comparative data have made several points that must be taken into account in understanding the impacts of under-population on

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“A” Civil Suit 402/1918, pawned at Ibu four years previously for £3/15; Ake “A” Civil Suit 875/1918, the palm trees alone pawned for £20 at Afojupa 10 years before; Ake “A” Civil Suit 583/1918, pawned for £5 at Igboro 18 years earlier; Ake “A” Civil Suit 143/1919, pawned for the deceased’s outstanding debts of £30/10 after his funeral 20 months earlier. In Ake “A” Civil Suit 130/1918, the defendant claimed the farm at Etepo had been pawned to him for £22/10 a year before, but court was skeptical of the size of the loan and his failure to use the plot for over seven months. This has not been included in the average.

<sup>184</sup>NAI, CSO 26 24873 Assessment Report Owode District.

<sup>185</sup>Ake Central Suit 174/1905.

<sup>186</sup>NAI, CSO 26 06827 Vol II “Pawning of Children” 30 Aug, 1926: Resident Oyo to Secretary, Southern Provinces.

<sup>187</sup>NAI, CSO 26 24873 Assessment Report Owode District.

<sup>188</sup>Abeokuta Civil Suit 740/1908, £2; Abeokuta Civil Suit 790/1908, two farms for £13/15 total (mean used in calculation); Abeokuta Civil Suit 810/1915, £5; Abeokuta Civil Suit 942/1910, £3/15 for 400 trees; Ake “A” Civil Suit 318/1917: disputed whether pawned for £10/15s or £5 (mean used in calculation); Ake “A” Civil Suit 593/1917, £3/15; Ake “A” Civil Suit 1229/1917, pawned for £12/10, approximately ten years earlier.

<sup>189</sup>Locke believed that property was created by the application of labor.

African institutions. First, when both productivity and population are low, the opportunity cost of coercion is high, and the benefit to creating estates is low. This explains why slavery is less common among the most sparsely populated African societies. Second, greater agricultural suitability (as well as access to trade), will encourage increased reliance on slavery. This explains why some of the most agriculturally prosperous though densely populated regions in Africa, such as Sokoto, also used slaves most intensively (Hill, 1985; Lovejoy and Hogendorn, 1993). Third, where brides were costly and polygyny existed in pre-colonial Africa, agricultural productivity (and hence the marginal product of labor) was highest, but population density was also greater. Inequality, then, is a prerequisite for unequal access to wives. Fourth, state strength in Africa has been associated with population density, but is not systematically related to agricultural productivity. Finally, there are substantial institutional spillovers across African societies relating to land, slavery, and the power of states. These revisions to the current thinking allow the “land-abundance” perspective to better explain institutions and institutional change in pre-colonial Egba society, and are borne out in comparative data.

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## APPENDIX A. DATA APPENDIX

This appendix gives sources and definitions for the geographic variables used and lists the matches used to connect the ethnic groups from Murdock (1967) to those in Murdock’s (1959) map. The geographic raster data are joined to Murdock’s (1959) map by taking the average of the points within an ethnic group’s territory.

A.1. **GIS Data.** Sources of GIS data and variable descriptions are given in Table 1.

Table 1: Data Sources

| Variable        | Description   | Citation                                    | Link  |
|-----------------|---|---|---|
| Agric. Suit.    | The GAEZ reports an index between 0 and 10 combining climate, soil and terrain slope constraints. The “Agric. Suit.” Measure is this the maximum of the observed values, minus this index, divided by the observed range. | Fischer et al. (2002)                       | <a href="http://www.iiasa.ac.at/Research/LUC/SAEZ/index.html">http://www.iiasa.ac.at/Research/LUC/SAEZ/index.html</a> |
| Pop. Dens. 1960 | Population density in 1960 per Sq. Km.  | UNESCO (1987) through UNEP/GRID-Sioux Falls | <a href="http://na.unep.net/datasets/datalist.php">http://na.unep.net/datasets/datalist.php</a>                       |
| Elevation       | Elevation in Km.  | N/A   | <a href="http://epp.eurostat.ec.europa.eu/">http://epp.eurostat.ec.europa.eu/</a>                                     |
| Precipitation   | Average annual precipitation (m). Missing values (due to differences in resolution between the data and map) are imputed using the nearest raster point.  | Fischer et al. (2002)                       | <a href="http://www.iiasa.ac.at/Research/LUC/SAEZ/index.html">http://www.iiasa.ac.at/Research/LUC/SAEZ/index.html</a> |
| Temperature     | The accumulated temperature on days with mean daily temperature above 0 °C. 55537 is treated as missing and these points are dropped before the join. Missing values imputed using the nearest raster point.              | Fischer et al. (2002)                       | <a href="http://www.iiasa.ac.at/Research/LUC/SAEZ/index.html">http://www.iiasa.ac.at/Research/LUC/SAEZ/index.html</a> |

Continued on next page

| Variable               | Description   | Citation                 | Link  |
|------------------------|---|--------------------------|---|
| Abs. Latitude          | Absolute value of the latitude of the ethnic group's centroid, reported by ArcMap.  | N/A                      | N/A   |
| Dist. to Lake Victoria | Distance, in 1000 Km, from the ethnic group's centroid to the center of Lake Victoria, calculated using the globdist function for Stata written by Kenneth Simons.  | N/A                      | N/A   |
| Dist. to Coast         | Average distance from all points in the ethnic group territory to the nearest point on the coast, in decimal degrees, calculated in ArcMap.   | N/A                      | N/A   |
| Malaria Suit.          | Climatic suitability for malaria transmission.  | Adjuik et al. (1998)     | <a href="http://www.mara.org.za/lite/download.htm">http://www.mara.org.za/lite/download.htm</a>               |
| Tsetse Suit.           | The raw data is the predicted presence of tsetse using satellite imagery on eco-climatic data, human population, and predicted cattle and cultivation levels. Because human population may be endogenous, this is converted into a binary variable (1 if it is greater than 0.5) and regressed as a probit on quadratics in precipitation, elevation, temperature, latitude and longitude. The predicted probability from this probit is used as the measure of tsetse suitability. | Wint and Rogers (2000)   | <a href="http://ergodd.zoo.ox.ac.uk/paatdown/index.htm">http://ergodd.zoo.ox.ac.uk/paatdown/index.htm</a>     |
| Ruggedness             | This is calculated using the user-written Vector Ruggedness Measure script for ArcMap. It "measures terrain ruggedness as the variation in three-dimensional orientation of grid cells within a neighborhood." The input data is the elevation data listed above, and the neighborhood size selected is 3, the smallest possible. Missing values imputed using the nearest raster point.  | Sappington et al. (2007) | <a href="http://arcscrip.esri.com/details.asp?dbid=15423">http://arcscrip.esri.com/details.asp?dbid=15423</a> |

Continued on next page

| Variable          | Description  | Citation | Link |
|-------------------|--|----------|------|
| Population Weight | This is an estimate of the population of the ethnic group, calculated by summing over the populations of cells contained in the population density data. If more than one group is assigned to a single territory, the population of each group is taken as the sum of the population within that territory divided by the number of groups. | N/A      | N/A  |

**A.2. Matches.** Ethnic groups were matched from the Ethnographic Atlas to Murdock’s (1959) map first by name, then by location. The majority (426) were matched exactly by name, and most of the rest were matched by using an alternative spelling (40) or alternative name (15). For some, the division of ethnic groups in the atlas did not match that in the map, and so these were matched either to a larger group of which they are a part (a “supergroup” – 20), a smaller group (a “subgroup” – 4), or another group that is part of the same “supergroup” (an “alternative supergroup” – 5). Finally, 21 groups could not be identified with those in the map, and so were matched to whatever group is at the latitude and longitude co-ordinates specified in the Atlas. Groups that matched exactly are not listed. Groups that had to be otherwise identified are given, along with the group to which they are matched and type of match in Table 2. This table also includes an ISO 639-3 code that indicates a corresponding entry in Gordon and Grimes (2005). Where this entry does not contain enough information on its own to justify the match, additional notes have been added to Table 2.

Table 2: Matches

| Name in Atlas        | Name in Map | ISO 639-3 | Name in Atlas | Name in Map       | ISO 639-3 |
|----------------------|-------------|-----------|---------------|-------------------|-----------|
| Alternative Spelling |             |           |               |                   |           |
| AULLIMIND            | AULLIMINDEN | ttq       | KARAMOJON     | KARAMOJONG        | kdj       |
| BAFIA                | FIA         | ksf       | KIPSIGIS      | KIPSIGI           | kln       |
| BALI                 | LI          | mhk       | KURAMA        | KURAMA, GURE (SE) | krh       |
| BAMUM                | MUM         | bax       | LAKA          | LAKA(ADAMAWA)     | lak       |
| BANEN                | NEN         | baz       | LENGE         | HLENGWE           | cce       |
| BANYANG              | ANYANG      | ken       | MBANDJA       | BANZA             | mmz       |
| BASAKOMO             | BASA        | bzw       | NGULU         | NGURU             | ngp       |
| BENIAMER             | AMER        | amf       | NGUMBI        | NGUMBE            | khu       |
| BIRIFOR              | BIRIFON     | bfo       | NYANKOLE      | NKOLE             | nyn       |
| BISA                 | BUSANSI     | bib       | PLTONGA       | TONGA             | toi       |
| BOMBESA              | MBESA       | zms       | PLAINSBIR     | BIRA              | brf       |
| CHAGGA               | CHAGA       | jmc/old   | PLAINSSUK     | SUK               | pko       |

Continued on next page



| Name in Atlas      | Name in Map        | ISO 639-3 | Name in Atlas | Name in Map     | ISO 639-3 |
|--------------------|--------------------|-----------|---------------|-----------------|-----------|
| CHAWAI             | JERAWA, CHAWAI(SW) | cch       | SAPEI         | SABEI           | kpz       |
| DAKAKARI           | BAKAKARI           | dri       | SARA          | SALA            | sba       |
| FUNGOM             | FUNGON             | bfm       | SHAWIYA       | SHAWIA          | shy       |
| FUTAJALON          | FOUTADJALON        | fuf       | SIWANS        | SIWA            | siz       |
| GIRIAMA            | GYRIAMA            | nyf       | XHOSA         | XOSA            | xho       |
| GURE               | KURAMA, GURE (SE)  | krh       | ZENAGA        | ZENEGA          | zen       |
| HILLSUK            | SUK                | pko       | ZINZA         | SINZA           | zin       |
| HONA               | KONA               | hwo       | ZUANDE        | ZUANDE, BATU(E) | N/A       |
| Alternative Name   |                    |           |               |                 |           |
| ABRON              | BRONG              | abr       | KAKWA         | BARI            | keo       |
| AWUNA              | GRUNSHI            | ewe       | LAKETONGA     | NYASA           | tog       |
| BOROROFUL          | SOKOTO             | fuv       | MAMBWE        | LUNGU           | mgr       |
| FALASHA            | KEMANT             | ahg       | MBUTI         | LESE            | les       |
| GALAB              | RESHIAT            | dsh       | NGONDE        | NYAKYUSA        | nyy       |
| HATSA              | KINDIGA            | hts       | RIFFIANS      | RIF             | rif       |
| JIMMA              | JANJERO            | jnj       | TURA          | GURO            | goa/neb   |
| KAGURU             | SAGARA             | kki       |               |                 |           |
| Subgroup           |                    |           |               |                 |           |
| SHONA              | KARANGA            | sna       | SOMALI        | MIJERTEIN       | som       |
| SIDAMO             | KAMBATA            | sid       | TSWANA        | NGWATO          | tsn       |
| Alternate Subgroup |                    |           |               |                 |           |
| ALAGYA             | AVIKAM             | ald       | SHANGAMA      | BAKO            | aiz       |
| KAGORO             | KATAB              | kcg       | UBAMER        | BAKO            | aiz       |
| NANKANSE           | GURENSI            | gur       |               |                 |           |
| Supergroup         |                    |           |               |                 |           |
| AFIKPO             | IBO                | ibo       | HAMMAR        | OMETO           | amf       |
| ANFILLO            | MAO                | myo       | KANAWA        | HAUSA           | hau       |
| ARBORE             | KONSO              | arv       | KASENA        | GRUNSHI         | xsm       |
| BANNA              | OMETO              | amf       | MALE          | OMETO           | mdy       |
| BASKETO            | OMETO              | bst       | NGONI         | SENGA           | ngo       |
| BASSARI            | TENDA              | bsc       | TALLENSI      | GURENSI         | gur       |
| BOMVANA            | XOSA               | xho       | TSAMAI        | KONSO           | tsb       |
| CONIAGUI           | TENDA              | cou       | VUGUSU        | LUO             | luo       |
| DIME               | OMETO              | dim       | YATENGA       | MOSSI           | mos       |
| DORSE              | OMETO              | doz       | ZAZZAGAWA     | HAUSA           | hau       |
| EFIK               | IBIBIO             | efi       |               |                 |           |
| Location           |                    |           |               |                 |           |
| ANAGUTA            | AFUSARE            | nar       | LOWIILI       | BIRIFON         | N/A       |
| BADITU             | OMETO              | N/A       | MESAKIN       | KOALIB          | jle       |
| BODI               | TOPOTHA            | mym       | MORO          | TALODI          | mor       |
| BURJI              | BORAN              | bji       | NYARO         | KOALIB          | fuj       |

Continued on next page

| Name in Atlas | Name in Map | ISO 639-3 | Name in Atlas | Name in Map | ISO 639-3 |
|---------------|-------------|-----------|---------------|-------------|-----------|
| DJAFUN        | NAMSHI      | fub       | OTORO         | TAGALI      | otr       |
| ISALA         | WABA        | sil       | SHAKO         | KAFA        | she       |
| KARA          | KEREWE      | reg       | TIRA          | TALODI      | tic       |
| KORONGO       | TUMTUM      | kgo       | TIRIKI        | NANDI       | ida       |
| KUSASI        | GURENSI     | kus       | TULLISHI      | NYIMA       | tey       |
| LALIA         | KELA        | lal       | WODAABE       | KANURI      | fuq       |

For AWUNA, see Grindal (1972).

KANAWA refers to the city of Kano.

For VUGUSU, see Wagner (1949).

YATENGA refers to the Mossi capital.

ZAZZAGAWA refers to the city of Zaria.

Djafun-Bororo is a Fulbe group.

## APPENDIX B. SAMPLE CASE: ABEOKUTA CIVIL SUIT 137/1909

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In the Native Court of Abeokuta Thursday the 4th day of March 1909 Before A.B. Green and S.J. Peters, Judges.

137/09 Odunusi of Ake vs. Taiwo of Kemta

Recovery of farm land at Olugbo property of the pltff

Odunusi sworn on Bible states: I am of Ake am a Farmer - my father Durojaiye of Ake took this farm at Olugbo in dispute as farm forest – after the Abo war – I accompanied my late father there together, with my brother Fatoki and two pawn men of my father. Lukosi of Kemta father of Deft Taiwo came to this farm 3 years after us, my late father Durojaiye gave portion him Lukosi some portion of his own forest farm to work upon – One Daresu an elder brother of my father Durojaiye had some forest farm Darun in his life time worked some portion of this and died, this Darun's portion both Irapa + forest was taken now by Deft Taiwo as farm belonging to his late father Lukosi – Durojaiye and Darun were brothers of the same parents. Darun had children as my self + Fatoki are sons of Durojaiye. The farms of Durojaiye and Darun are now being claimed by Deft – which has no right to do.

Deft – Taiwo sworn on the Bible States: - I am of Kemta, am a farmer. One Ande of Kemta took my father Lukosi of Kemta to this farm at Olugbo about the Abo war. Durojaiye father of pltff first got to this farm, and first took his portion of forest, then my father took next then Lukosi's boys, about 13 boys then serving my late father in this farm. I never heard of the name of Darun in this farm during the Ibadan warfare against the Egbas bother my father + Durojaiye pltff's father left this farm and never returned to the place till about 12 years ago when my father's people and pltff returned to the farm – but I did not for pltff laid hold of his father's farm and my father's boys laid hold of my father's. There is the Porogun trees planted on the boundary of the farms of Durojaiye and Lukosi till today. It was the plaintiff who trespassed on my father's land. I never knew any farm belonging to Darun in this part.

For pltff Fatoki sworn on cutlass states: - I am of Ake, am an Ifa priest and son of Durojaiye. Ande of Kemta and my father Durojaiye started at the same time for this farm region the same

day Ande took his portion and Durojaiye this portion side by side. My father Durojaiye first got to this farm, three years after Lukosi father of Deft came, my father there gave him the forest farm of one Sholoye which my father had taken for him and he never turned up. After the warfare Lukosi people and my father's people had to leave this farm. At the return Lukosi people laid claim on our father's farm . by trespassing over the boundary. I heard at a time the Kemta planted Porogun trees on the boundary. Darun an elder brother of Durojaiye my father had a farm, which is now being claimed by Deft in conjunction with Durojaiye's.

Aboni sworn on Cutlass States: I am of Kemta. One Faroubi of Kemta took us to this farm. We were there for good length of time before Durojaiye Father of pltff came. Durojaiye came of himself but Ande of Kemta gave him forest. Lukosi father of Deft came two years after Durojaiye, Lukosi took portion of farm Durojaiye had reserved for one of his people but it was forest. The farm in dispute is part of Lukosi's farm. Lukosi's farm is in the middle of Durojaiye's farm and Igbonla – on the other side of Durojaiye is Ogunbiyi's farm. At a time when there was a dispute of boundary between Lukosi and Durojaiye's farm, the Kemta chiefs settled it then by planting porogun trees. These trees are there till today.

For Deft Sanyaolu sworn on cutlass states: I am Kemta am a carver and a hunter. Ande of Kemta was my grandfather who took Durojaiye father of pltff to this farm and allotted to him portion of forest farm land. This Ande took Lukosi father of Deft to this farm Olugbo and gave him forest farm. This was at the Ijaiye war. I was then present. I was as old as I am during the Abo war of 1857.

I say the court after cross examination that I am telling a lie.

Case adjourned till Monday Mar-8-09

A.B. Green Pres.

Saml J. Peters

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In the Native Court of Abeokuta Monday the 8th day of March 1909 Before A.B. Green and S.J. Peters Judges.

137/09 Oduwusi of Ake vs. Taiwo of Kemta

Recovery of farm land at Olugbo property of the pltff

Dagin sworn on cutlass states: I am of Kemta. I know the farm in dispute at Olugbo. The farm was originally taken Lukosi of Kemta during the Abo war. I know that the farm was originally taken by Lukosi because I accompanied them there 17 days after – Ande, Ogunbiyi and Durojaiye father of pltff each took portion of this farm alongside one another. Ogunbiyi was in the middle of these people. Durojaiye being on one side Likosi father of Deft is on the right hand of Durojaiye, Lukosi gave his left to Igbo Inta. The land mark between Durojaiye and Lukosi was made by planting Porogun trees by the Kemta people when there was difference on this land at a time Durojaiye father of pltff had a farm there and Lukosi father of Deft also had a farm.

Aruno sworn on cutlass states: I am of Kemta. I was slave of Lukosi father of Deft. This farm was taken during the Abo war. I did not go with them but afterwards I went there after two years

Lukosi got there. Durojaiye was the first to get to this farm then Lukosi my master. When Lukosi came he took the forest next to Durojaiye. Durojaiye never ran away from this farm, but died.

Case adjourned till Wednesday when escort will be sent to this farm to see the porogun trees planted by the Kemta people.

A.B. Green Pres.

Saml J. Peters

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Oseni sworn on the Koran states: I am police no. 29 EUG. I was sent by the court to the farm in question at Olugbo. I summonsed the villagers. I found the two farms of pltff and deft side by side. The boundary was marked by Porogun trees from one end to another, these porogun trees were planted by Chiefs of Kemta, when there was a fight on this subject once. Pltff showed me two porogun trees which one was in the middle of Defts farm, and one in some part of a road which he said was boundary. I found it was no boundary and the villagers said the same that boundary is the straight demarcation in which porogun trees were planted straight from one end to another. It was pltff who trespassed into Defts farm. The porogun trees in the boundary are about 24. The poroguns are about 5 years old. The two poroguns pltf showed me were trees of themselves of no object.

Judgment – Court decides that the boundary as marked by the 24 porogun trees planted by the authorities of Kemta should from now be taken as boundary between the land farms of late Durojaiye of Ake and Lukosi of Kemta. No notice should ever be taken of the two accidental porogun trees pointed out by pltff. Judgment for Deft.

A.B. Green Pres.

Saml J. Peters.

FIGURE 1. Institutional regions and dynamics

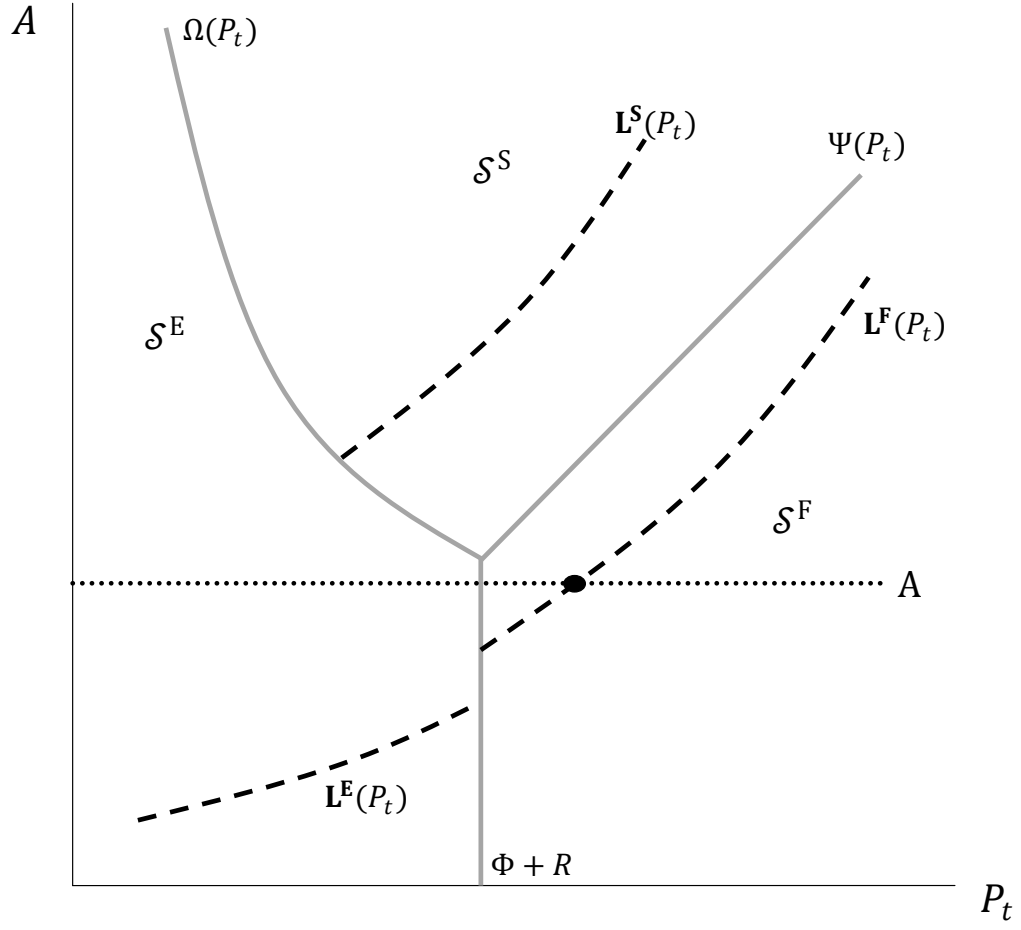
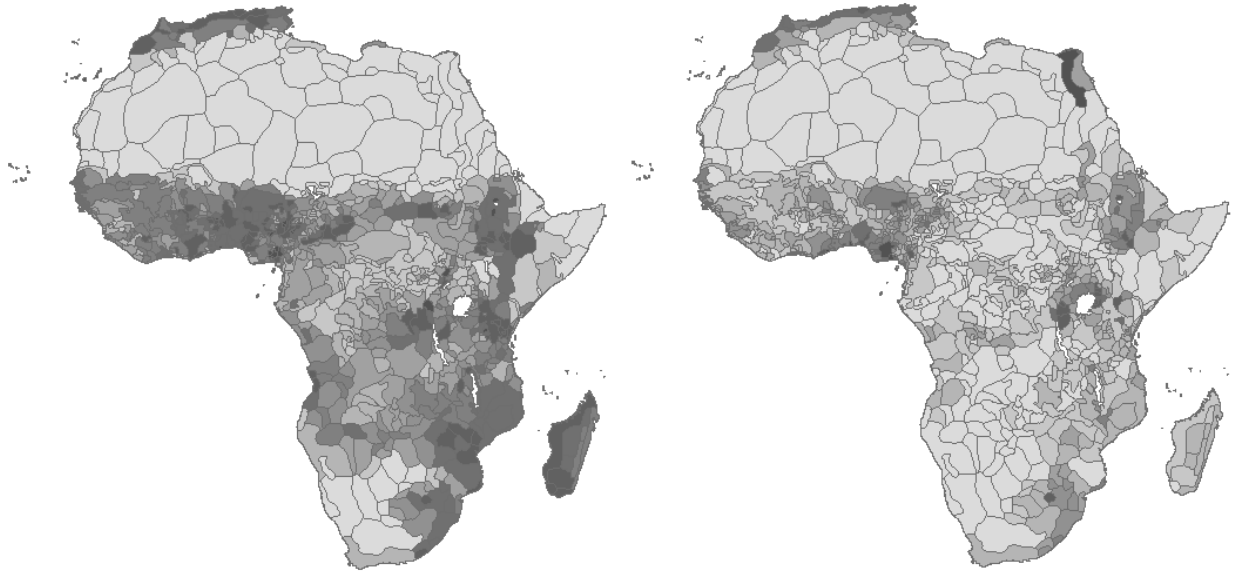


FIGURE 2. Agricultural Suitability and Population Density, 1960



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Agricultural suitability is on the left, population density on the right. Darker colors indicate higher values; the range of agricultural suitability is from 0 to 1, while the range for population density is from 0 to 315.25.



FIGURE 3. Egba Local Government Areas in Ogun State



FIGURE 4. Punch's Tour of Egba Country, 1902



TABLE 3. Summary statistics

| Variable                                | Mean  | Std. Dev. | Min.  | Max.  | N   |
|---|-------|-----------|-------|-------|-----|
| <i>Institutional Outcomes</i>           |       |           |       |       |     |
| Any Indiv. Land Rights                  | 0.93  | 0.25      | 0     | 1     | 404 |
| Any Slavery                             | 0.85  | 0.36      | 0     | 1     | 454 |
| Consideration for Bride                 | 0.93  | 0.26      | 0     | 1     | 529 |
| Polygyny                                | 0.95  | 0.21      | 0     | 1     | 517 |
| State Stratification                    | 0.34  | 0.47      | 0     | 1     | 475 |
| Class Stratification                    | 0.53  | 0.5       | 0     | 1     | 426 |
| <i>Geographic Controls</i>              |       |           |       |       |     |
| Agricultural Suitability                | 0.53  | 0.18      | 0     | 1     | 531 |
| Population Density (1960)               | 21.8  | 29.3      | 0     | 315   | 531 |
| Elevation                               | 703   | 506       | -14.9 | 2306  | 531 |
| Precipitation                           | 1.12  | 0.57      | 0.013 | 2.98  | 531 |
| Temperature                             | 8.82  | 1.19      | 5.31  | 10.8  | 531 |
| Malaria Suit.                           | 0.77  | 0.33      | 0     | 1     | 531 |
| Tsetse Suit.                            | 0.54  | 0.42      | 0     | 1     | 531 |
| Dist. to Coast.                         | 5.5   | 3.84      | 0.023 | 14.9  | 531 |
| Dist. to Lake Victoria                  | 2.37  | 1.51      | 0.13  | 5.8   | 531 |
| Ruggedness                              | 0.22  | 0.076     | 0.031 | 0.77  | 531 |
| Abs. Latitude                           | 9.89  | 7.58      | 0.017 | 36.6  | 531 |
| Population Weight                       | 410   | 1267      | 0.34  | 25611 | 531 |
| <i>Controls from Ethnographic Atlas</i> |       |           |       |       |     |
| Major Crop: Missing                     | 0.072 | 0.26      | 0     | 1     | 531 |
| Major Crop: None                        | 0.024 | 0.15      | 0     | 1     | 531 |
| Major Crop: Tree Fruits                 | 0.089 | 0.28      | 0     | 1     | 531 |
| Major Crop: Roots and Tubers            | 0.16  | 0.37      | 0     | 1     | 531 |
| Date Observed                           | 1919  | 21.7      | 1830  | 1960  | 531 |

**Notes:** The omitted crop type is cereal grains, the mode.

Table 4: Tests 1 and 2

| <i>Any Indiv. Land Rights</i> |                    |                    |                    |                    |                   |
|-------------------------------|--------------------|--------------------|--------------------|--------------------|-------------------|
| Agricultural Suitability      | 2.12***<br>(0.740) | 3.06**<br>(1.539)  | 3.23***<br>(0.936) | 2.94***<br>(1.019) | 2.50**<br>(0.976) |
| Ln(Pop. Density)              |                    |                    |                    | 0.55***<br>(0.143) |                   |
| Pop. Density (1960)           |                    |                    |                    |                    | -2.56<br>(4.322)  |
| Pop. Density Sqd.             |                    |                    |                    |                    | 12.92<br>(8.531)  |
| Observations                  | 404                | 368                | 321                | 321                | 321               |
| Other Controls                | No                 | Yes                | Yes                | Yes                | Yes               |
| Region F.E.                   | North/Sahara       | No                 | Yes                | Yes                | Yes               |
| <i>Any Slavery</i>            |                    |                    |                    |                    |                   |
| Agricultural Suitability      | 0.03<br>(0.600)    | 1.93***<br>(0.715) | 1.63*<br>(0.888)   | 1.66*<br>(0.877)   | 1.74**<br>(0.815) |
| Ln(Pop. Density)              |                    |                    |                    | 0.47**<br>(0.187)  |                   |
| Pop. Density (1960)           |                    |                    |                    |                    | 1.98<br>(1.295)   |
| Pop. Density Sqd.             |                    |                    |                    |                    | -0.63<br>(0.456)  |
| Observations                  | 454                | 454                | 366                | 365                | 366               |
| Other Controls                | No                 | Yes                | Yes                | Yes                | Yes               |
| Region F.E.                   | North/Sahara       | No                 | Yes                | Yes                | Yes               |

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|                          |                                |         |         |         |         |
|--------------------------|--------------------------------|---------|---------|---------|---------|
|                          | <i>Consideration for Bride</i> |         |         |         |         |
| Agricultural Suitability | -1.10                          | 1.19    | 3.44*   | 3.43*   | 3.43*   |
|                          | (1.028)                        | (1.368) | (2.039) | (1.988) | (1.991) |
| Ln(Pop. Density)         |                                |         |         | 0.13    |         |
|                          |                                |         |         | (0.226) |         |
| Pop. Density (1960)      |                                |         |         |         | 0.28    |
|                          |                                |         |         |         | (1.331) |
| Pop. Density Sqd.        |                                |         |         |         | -0.12   |
|                          |                                |         |         |         | (0.400) |
| Observations             | 491                            | 529     | 413     | 412     | 413     |
| Other Controls           | No                             | Yes     | Yes     | Yes     | Yes     |
| Region F.E.              | North/Sahara                   | No      | Yes     | Yes     | Yes     |
|                          | <i>Polygyny</i>                |         |         |         |         |
| Agricultural Suitability | -0.68                          | 4.69*** | 6.06*** | 6.06**  | 5.26*   |
|                          | (0.447)                        | (1.672) | (2.286) | (2.605) | (2.858) |
| Ln(Pop. Density)         |                                |         |         | 0.38    |         |
|                          |                                |         |         | (0.413) |         |
| Pop. Density (1960)      |                                |         |         |         | 2.38    |
|                          |                                |         |         |         | (3.151) |
| Pop. Density Sqd.        |                                |         |         |         | -0.80   |
|                          |                                |         |         |         | (2.234) |
| Observations             | 517                            | 434     | 205     | 203     | 205     |
| Other Controls           | No                             | Yes     | Yes     | Yes     | Yes     |
| Region F.E.              | North/Sahara                   | No      | Yes     | Yes     | Yes     |

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|                          |                             |         |         |         |         |
|--------------------------|-----------------------------|---------|---------|---------|---------|
|                          | <i>State Stratification</i> |         |         |         |         |
| Agricultural Suitability | 0.93*                       | 1.32**  | 0.53    | 0.59    | 0.08    |
|                          | (0.536)                     | (0.665) | (0.715) | (0.737) | (0.746) |
| Ln(Pop. Density)         |                             |         |         | 0.32**  |         |
|                          |                             |         |         | (0.141) |         |
| Pop. Density (1960)      |                             |         |         |         | 2.67*   |
|                          |                             |         |         |         | (1.373) |
| Pop. Density Sqd.        |                             |         |         |         | -1.43   |
|                          |                             |         |         |         | (0.950) |
| Observations             | 475                         | 475     | 475     | 472     | 475     |
| Other Controls           | No                          | Yes     | Yes     | Yes     | Yes     |
| Region F.E.              | North/Sahara                | No      | Yes     | Yes     | Yes     |
|                          | <i>Class Stratification</i> |         |         |         |         |
| Agricultural Suitability | -0.15                       | -0.08   | -0.33   | -0.37   | -0.64   |
|                          | (0.587)                     | (0.994) | (1.020) | (1.009) | (0.847) |
| Ln(Pop. Density)         |                             |         |         | 0.21    |         |
|                          |                             |         |         | (0.164) |         |
| Pop. Density (1960)      |                             |         |         |         | 2.70*   |
|                          |                             |         |         |         | (1.505) |
| Pop. Density Sqd.        |                             |         |         |         | -1.34   |
|                          |                             |         |         |         | (0.985) |
| Observations             | 426                         | 426     | 401     | 400     | 401     |
| Other Controls           | No                          | Yes     | Yes     | Yes     | Yes     |
| Region F.E.              | North/Sahara                | No      | Yes     | Yes     | Yes     |

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\*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10%.

**Notes:** Robust standard errors in parentheses. All regressions are probit, with coefficients reported. Observations are weighted by estimated population in 1960 and standard errors are clustered by region.

**Region FE:** African Hunters, South African Bantu, Central Bantu, Northeast Bantu, Equatorial Bantu, Guinea Coast, Western Sudan, Nigerian Plateau, Eastern Sudan, Upper Nile, Ethiopia/Horn, Moslem Sudan, Sahara, North Africa, and Indian Ocean.

**Other Controls:** Malaria suitability, tsetse suitability, ruggedness, dummies for major crop types (missing, none, tree fruits, roots/tubers included, cereal grains excluded), date of observation, absolute latitude, absolute latitude X latitude > 0, and quadratics in elevation, annual precipitation, accumulated temperature, distance to lake Victoria, and distance to the nearest coast.

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TABLE 5. Neighbor effects

|                          | <i>Any Indiv. Land Rights</i>  | <i>Any Slavery</i>          |
|--------------------------|--------------------------------|-----------------------------|
| Agricultural Suitability | 2.16                           | 2.09                        |
| 90% CI                   | [0.48,3.91]                    | [0.37,4.19]                 |
| $\rho$                   | -0.22                          | 0.70                        |
| 90% CI                   | [-0.36,-0.06]                  | [0.31,0.96]                 |
| Region FE                | North/Sahara                   | North/Sahara                |
| Other Controls           | Yes                            | Yes                         |
| obs                      | 368                            | 454                         |
|                          | <i>Consideration for Bride</i> | <i>Polygyny</i>             |
| Agricultural Suitability | 0.76                           | -2.01                       |
| 90% CI                   | [-0.59,2.11]                   | [-4.48,0.26]                |
| $\rho$                   | 0.10                           | 0.23                        |
| 90% CI                   | [-0.09,0.33]                   | [-0.05,0.63]                |
| Region FE                | North/Sahara                   | North/Sahara                |
| Other Controls           | Yes                            | Yes                         |
| obs                      | 491                            | 434                         |
|                          | <i>State Stratification</i>    | <i>Class Stratification</i> |
| Agricultural Suitability | 0.59                           | 0.33                        |
| 90% CI                   | [-0.23,1.46]                   | [-0.45,1.11]                |
| $\rho$                   | 0.31                           | 0.32                        |
| 90% CI                   | [0.16,0.44]                    | [0.18,0.46]                 |
| Region FE                | North/Sahara                   | North/Sahara                |
| Other Controls           | Yes                            | Yes                         |
| obs                      | 475                            | 426                         |

**Notes:** 90% confidence intervals in brackets. All regressions are spatial probit, with coefficients reported (see LeSage and Pace (2009)).

**Other Controls:** Malaria suitability, tsetse suitability, ruggedness, dummies for major crop types (missing, none, tree fruits, roots/tubers included, cereal grains excluded), date of observation, absolute latitude, absolute latitude X latitude > 0, and quadratics in elevation, annual precipitation, accumulated temperature, distance to lake Victoria, and distance to the nearest coast.

TABLE 6. Summary statistics: Court cases

| Variable                           | Mean  | Std. Dev. | Min. | Max. | N   |
|------------------------------------|-------|-----------|------|------|-----|
| Case is Complete                   | 0.66  | 0.47      | 0    | 1    | 541 |
| Recovery                           | 0.64  | 0.48      | 0    | 1    | 541 |
| Trespassing                        | 0.23  | 0.42      | 0    | 1    | 541 |
| Year                               | 1914  | 5.15      | 1902 | 1919 | 541 |
| Cocoa                              | 0.27  | 0.44      | 0    | 1    | 541 |
| Palm Trees                         | 0.38  | 0.48      | 0    | 1    | 541 |
| Water                              | 0.072 | 0.26      | 0    | 1    | 541 |
| Damages or Value Claimed           | 14.9  | 29.9      | 0.50 | 300  | 366 |
| Land Pawned                        | 0.25  | 0.43      | 0    | 1    | 541 |
| Land Sold                          | 0.12  | 0.33      | 0    | 1    | 541 |
| Boundary Made                      | 0.15  | 0.36      | 0    | 1    | 541 |
| Destruction of Crops or Boundaries | 0.094 | 0.29      | 0    | 1    | 541 |
| Taken to Chiefs                    | 0.26  | 0.44      | 0    | 1    | 541 |
| Caretaker                          | 0.11  | 0.32      | 0    | 1    | 541 |
| Juju                               | 0.059 | 0.24      | 0    | 1    | 541 |
| Participant Driven Out             | 0.089 | 0.28      | 0    | 1    | 541 |

**Notes:** "Water" indicates a stream, river, marsh or swamp. "Cocoa," "Kola" and "Palm Trees" indicate that these are stated to exist on the land in dispute. "Previously Taken to Chiefs" indicates the dispute was previously taken to the township chiefs. Events such as "Land Pawned" or "Juu Placed" indicate that these occurred at any point in the land's history.

TABLE 7. Land characteristics, transactions and strategies

|                    | Damages/Value       | <i>Value and Transactions</i> |                    |                  |
|--------------------|---------------------|-------------------------------|--------------------|------------------|
|                    |                     | Pawned                        | Sold               |                  |
| Cocoa              | 7.40**<br>(3.172)   | 0.13<br>(0.115)               | 0.32**<br>(0.156)  |                  |
| Palm Trees         | -6.26**<br>(2.441)  | 0.35***<br>(0.085)            | 0.05<br>(0.078)    |                  |
| Water              | -7.89***<br>(1.446) | -0.52<br>(0.348)              | 0.15<br>(0.263)    |                  |
| Observations       | 366                 | 541                           | 541                |                  |
| Other Controls     | Yes                 | Yes                           | Yes                |                  |
| Judgment Book F.E. | Yes                 | Yes                           | Yes                |                  |
|                    | Destruction         | <i>Strategies</i>             |                    |                  |
|                    |                     | Taken to Chiefs               | Caretaker          | Driven Out       |
| Cocoa              | 0.57**<br>(0.246)   | 0.30**<br>(0.128)             | -0.07<br>(0.132)   | 0.40*<br>(0.209) |
| Palm Trees         | 0.04<br>(0.196)     | 0.45***<br>(0.098)            | 0.51***<br>(0.145) | 0.11<br>(0.175)  |
| Water              | 0.18<br>(0.477)     | -0.18<br>(0.174)              | 0.13<br>(0.304)    | -0.04<br>(0.215) |
| Observations       | 541                 | 541                           | 541                | 541              |
| Other Controls     | Yes                 | Yes                           | Yes                | Yes              |
| Judgment Book F.E. | Yes                 | Yes                           | Yes                | Yes              |

\*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10%.

**Notes:** Robust standard errors in parentheses. All regressions except with “Damages/Value” are probit, with coefficients reported. “Damages/Value” is OLS. Other controls are a dummy if the claim is for recovery and a dummy if the case is complete. Standard errors are clustered by judgment book.